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Research Report

PREVALENCE OF MAJOR DEPRESSIVE DISORDER AMONG WIVES OF MEN WITH ALCOHOL USE DISORDER-A CROSS-SECTIONAL STUDY FROM A TERTIARY CARE HOSPITAL

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ABSTRACT

Background: Alcohol Use Disorder is highly prevalent in India. Alcohol acts as a continuous stressor, with several stressful consequences on the wife. Literature suggests an association between alcohol use in the husband and depression in the wife. **Objectives:** The primary objective was to assess the prevalence of Major Depressive Disorder(MDD) among wives of men with Alcohol Use Disorder attending the Psychiatry Department in a tertiary care centre. The secondary objective was to assess various sociodemographic and clinical variables associated with depressive disorder in the wives. **Methods:** A cross-sectional study was done on wives of men diagnosed with Alcohol Use Disorder while attending the outpatient clinic or inpatient treatment at the Psychiatry Department. Consecutive sampling was done till the calculated sample size of 133 was reached. PHQ 9 was administered to the wives to assess Depressive Disorder with a cutoff score of 10. Statistical analysis was done using the Chi-square test. Odds Ratio and confidence intervals were calculated to determine the strength of associations. **Results:** Prevalence of Major Depressive Disorder in the study population was found to be 27.8%. A significant association was found between the severity of Alcohol Use Disorder and depression in wives (OR=4.01,95%CI=1.4411.22, p<0.01). Morning drinking among husbands was significantly associated with depression in wives(OR=4.32,95%CI=1.32-19.56, p=0.04). **Conclusion:** Prevalence of Major Depressive Disorder among wives of men with Alcohol Use Disorder was high. Depressive disorder in wives significantly correlated with the severity of Alcohol Use Disorder and the husbands' morning drinking. Hence wives of men with Alcohol Use Disorder should be routinely screened for depression, and necessary interventions should be given promptly.

Keywords: Major Depressive Disorder, Alcohol Use Disorder, wives

INTRODUCTION

Alcohol Use Disorder causes a wide spectrum of physical and mental health problems.[1] Nearly 27.3% of the Indian male population consumes alcohol.[2] The prevalence of alcohol use varies across different parts of the country.[3] Several studies have reported that the rate of alcohol consumption in the South Indian state of Kerala is higher than the national rate.[4,5,6] Hence there is a revived interest in studies on alcohol and its related problems in Kerala.

In the family context, the wife of the man with alcohol use disorder experiences high stress levels and low

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quality of life.[7, 8] She is subjected to multiple stressors such as emotional and physical abuse, financial issues and increased risk of separation or divorce.[7, 8] Studies indicate that spouses of men with alcohol use disorder experience higher rates of depressive, anxiety and stress-related disorders.[9, 10, 11]

Identifying depression in the spouse of the person with Alcohol Use Disorder is important because she plays a significant role in treatment strategies for her husband.[10] A Sri Lankan study conducted in rural communities of Lanka concluded that on average, one in three women whose husbands used alcohol had Major Depressive Disorder.[12]

A descriptive study conducted by Kishore et al. [13] in India showed a 43% prevalence of Major Depressive Disorder among spouses of men with Alcohol Dependence Syndrome. Depression also had a significant correlation with the severity of alcohol use.[13]

A study conducted in Goa in 2010 concluded that there is an increased prevalence of common mental health problems like depression in women whose husbands used alcohol.[11]

Despite high prevalence rates for Alcohol Use Disorders[4] and Depressive Disorders[15] in Kerala, there is a dearth of studies on depression in the spouse of a person with Alcohol Use Disorder.

OBJECTIVES

Primary Objective

To estimate the prevalence of Major Depressive Disorder among wives of men with Alcohol Use Disorder attending the outpatient clinic or admitted as an inpatient in the Psychiatry Department of a tertiary care teaching institute.

Secondary Objective

To study the association of various sociodemographic and clinical variables with Major Depressive Disorder in the wives of men with Alcohol Use Disorder

MATERIALS AND METHODS

This cross-sectional observational study was done at the outpatient clinic and the inpatient wards of the Department Of Psychiatry of Government Medical College, Thiruvananthapuram in Kerala. The approval of the Institutional Research Committee and the Institutional Ethics Committee was obtained. The study period was one year, from January 2017 to December 2017.

The sample size was calculated based on the formula $N=4pq/d^2$ where p is the proportion of Major depressive Disorder from a previous study[13] With p=43, q=100-p=57; d=20% of p, the calculated sample size was 133. Consecutive cases meeting the inclusion criteria were recruited till an adequate sample size was reached.

Inclusion Criteria

Women aged 18-55 years whose husbands were clinically diagnosed with Alcohol Use Disorder as per DSM 5 criteria were included in the study. Those who did not give consent were excluded.

Procedure

The wives of patients already diagnosed with Alcohol Use Disorder as per DSM-5[16] criteria were invited to participate in the study. Those who satisfied the study criteria were enrolled into the study after collecting a written informed consent. Sociodemographic and clinical details were collected in a semi-structured proforma. Depression in the study population was assessed using the PHQ-9 Questionnaire.[17, 18] For this study, a cut–off score of 10 was taken for diagnosing Major Depressive Disorder. Those who scored positive for depression were subclassified based on PHQ 9 score as follows:

Major Depressive Disorder Mild- 10-14

Major Depressive Disorder Moderate- 15-19

Major Depressive Disorder Severe- 20-27

Categorical variables were presented as frequencies and percentages. The data collected were analyzed using SPSS version 20. Comparison of proportions was made by using the Chi-Square test. Odds ratio and their confidence intervals were calculated to determine the strength of the associations

RESULTS

In the study, 133 males were diagnosed to have Alcohol Use Disorder and their spouses were evaluated. 61 % of the males were below 40 years, with a mean age of 44.3 years. 43% of the husbands were unskilled labourers, or unemployed .57 % had skilled or semiskilled jobs. The majority (97%) of the men had a monthly income of less than 5000 rupees. 43.6% consumed an average of 181-

375 ml of alcohol. 85% consumed alcohol daily. (Table 1)

Table 1. Background variables of subjects with AUD.(N=133)

Variables		Frequency	%
Age	Above 40 years	52	39
	Below 40 years	81	61
Education	Above high school	95	71.4
	Below high School	38	28.5
Occupation	Semiskilled and skilled	76	57.1
	Unemployed or unskilled	57	42.8
Religion	Hindu	111	83.4
	others	22	16.5
Income	Above 5000	4	3
	below 5000	129	97
Alcohol Use	Above 5 years	123	92.5
	below 5 years	10	7.5
Quantity of alcohol	Above 375ml	56	42
	below 375 ml	77	58
Daily Drinking	Yes	113	85
	No	20	15
Morning Drinking	Yes	112	84.21
	No	21	15.8
Withdrawal Symptoms	Yes	120	90.2
	No	13	9.8
Medical Illness	Yes	73	54.9
	No	60	45.1
Psychiatric Illness	Yes	34	25.56
	No	99	74.43
Years of marriage	Above 20 years	47	35.33
	below 20 years	86	64.66
Legal issues	Yes	19	14.3
	No	114	85.7
Severity of alcohol Use	Severe	91	68.4
	Mild and Moderate	42	31.6

Morning drinking was reported in 84.2%. Withdrawal symptoms were reported in 90.2% of the males.92.5% had a history of alcohol use of more than five years.14.3% had alcohol-related legal issues (Table 1). 68.4% had severe Alcohol Use Disorder, 22.6% had moderate, while 9% had mild Alcohol Use Disorder.

The variables assessed in the wives were age, religion, and occupation, presence of thyroid disease, intake of medications, history of deliberate self-harm, family history of mood disorder and history of physical abuse. The majority of women belonged to the less than 40 years group (63.1%) with a mean age of 38.7years.61% were housewives.12.8% reported a history of thyroid disease. In contrast, 11.3% reported taking medications for physical illness., 36.1% reported a history of physical abuse10.5% of the women had attained menopause.9% had a history of mood disorder. (Table 2)

Table 2. Background variables of wives of subjects with AUD (N=133)

Variables		Frequency	%
Age	above 40	49	36.9
	below 40	84	63.1
Occupation	Housewife	81	60.9
	others	52	39.1
Religion	Hindu	113	85
	others	20	15
Thyroid Dysfunction	Yes	17	12.8
	No	116	87.2
Medications	Yes	15	11.3
	No	118	88.7
Family history of mood disorder	Yes	12	9
	No	121	91
Menopause	Yes	14	10.5
	No	119	89.5
History of Deliberate Self Harm	Yes	16	12
	No	117	88
Physical Abuse	Yes	48	36.1
	No	85	63.9
History of mood disorder	Yes	2	1.5
	No	131	98.5

A total of 133 women were evaluated for depression using the PHQ-9 tool. Thirty-seven women who scored a cut off of 10 and above on the PHQ -9 scale were diagnosed with Major Depressive Disorder, amounting to a prevalence of 27.8% for Major Depressive Disorder 27.8%. Among the 37 women who had Major Depressive Disorder,73% had mild depression, 16 % had moderate depression, and 11% had severe depression.

Depressive disorder was more common in wives of men who consumed alcohol for more than five years, but the association was not statistically significant(p=1 by Fisher's exact). Depressive disorder was more common in wives of men who had withdrawal symptoms, but the association was not statistically significant(p=1 by Fisher's exact).

Table 3.Association between severity of alcohol use of husbands and depression in wives (N=)

DSM 5 diagnosis AUD (husband)	Depression(wife)				χ^2	df	p-value
	Yes		No				
	N	%	N	%			
Mild	3	8.1	9	9.4			
Moderate	2	5.4	28	29.2	9.177	2	0.010*
Severe	32	86.5	59	61.5			

AUD- Alcohol Use Disorder. X^2 - Chi-square value. df- degrees of freedom. *p<0.05

A significant association was seen between the severity of alcohol use of husbands and depression in their wives (OR=4.01, 95%CI=1.44-11.22, p<0.05) (Table 3). A significant association was also noted between morning drinking of husband and depression in wives (OR=4.32, 95%CI=1.32-19.56, p<0.05) (Table 4)

Table 4. Association between morning drinking of husbands and depression in wives

Morning drinking	Depression				χ^2	df	p-value
	Yes		No				
	N	%	N	%			
Yes	35	94.6	77	80.2	4.16	1	0.041
No	2	5.4	19	19.8			

X^2 - Chi-square value. df- degrees of freedom. *p<0.05

The other sociodemographic and clinical variables did not show a significant association with depression in the wife.

DISCUSSION

The current study was done to estimate the prevalence of Major Depressive Disorder among wives of men with Alcohol Use Disorder attending the Psychiatry department of Government Medical College, Thiruvananthapuram.

The Prevalence of Major Depressive Disorder in the wives was 27.8% in the present study. Among the 37 women who had Major Depressive Disorder, two had a past history of mood disorder. PHQ-9 tool though sensitive to screen and diagnose current Major Depressive Disorder,[18] does not rule out Dysthymia and Bipolar Depression. This study being cross-sectional, all women who scored a cut off of 10 and above with the PHQ-9 scale were diagnosed as having Major Depressive Disorder irrespective of their previous mood episodes.

A significant association was seen between the severity of Alcohol Use Disorder of the husband and Major Depressive Disorder in the wives (OR=4.01, 95%CI=1.44 -11.22, p<0.01). A significant association was also noted between morning drinking of husband and depression in wives (OR=4.32, 95%CI=1.32-19.56, p=0.040). These findings are in concordance with other studies conducted in India and neighbouring countries[9,12]

A Sri Lankan study by Aryasinghe et al. in 2008[12] reported a point prevalence of 33.3%of Major Depressive Disorder in spouses of men with Alcohol Use Disorder. Severe alcohol Use and morning drinking were also positively associated with depressive disorder. Morning drinking of the husband increased the odds of depression (OR=4.11, C.I=1.01-1.09; p=0.0003) which is comparable to our study

A study done at a tertiary care centre at Assam among spouses of men with Alcohol Dependence Syndrome by Ghosh et al. in 2017 reported a prevalence of 30.43% for depressive disorders.[14] This study which used ICD 10 criteria for diagnosing Alcohol Dependence syndrome and Depressive disorder, is comparable to our study.

Comparable results were obtained in another Kerala based study conducted in 2017 by Archana et al.[15] The Prevalence of Major Depressive Disorder in wives of men with Alcohol Use Disorder was 26.5% in this study.

Compared to our study, a study from Maharashtra by Bagul et al. in 2015 reported a low prevalence of 13.33% for depression in spouses of men with Alcohol Use Disorder.[9] This study assessed only outpatients and used SCID 1 as tool for depression. This tool has lower sensitivity and higher specificity compared to PHQ 9, hence the lower prevalence rates.

A high prevalence rate of 97% for depressive symptoms in spouses was reported by Padmavathi et al.[10] in Tamil Nadu. This study had a low sample size of 30, the population was from a de-addiction centre, and the tool used was the Centre for Epidemiological Studies

Depression Scale. These could be the reasons for the high prevalence rate compared to our study.[8]

Various sociodemographic and clinical variables did not show any significant association with depression in the spouse. 36.1% of the study population reported a history of physical violence. A positive correlation was found between the history of physical abuse in wives and the prevalence of depression, but it was insufficient to establish clinical significance. (p=0.06). Campbell had identified depression as major morbidity in women with a history of physical abuse.[19] The clinical insignificance in our study could be due to cultural differences from the western population, low sample size and lack of a structured tool for assessing physical abuse.

LIMITATIONS

This study design is cross-sectional; hence causal relationships cannot be assessed. Major Depressive Disorder was diagnosed based on cross-sectional assessment using PHQ-9. PHQ -9 does not rule out Bipolar Depression. The results are from a tertiary care teaching centre, hence cannot be generalized to the population at large.

CONCLUSIONS

The Prevalence of Major Depressive Disorder among wives of men with Alcohol Use Disorder was estimated to be 27.8%. Depression in the wives was significantly associated with the severity of Alcohol Use Disorder in the husband

Depression in the wife was significantly associated with morning drinking of the husband.

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None

REFERENCES

1. Das SK, Balakrishnan V, Vasudevan DM. Alcohol: its health and social impact in India. Natl Med J India. 2006 Mar-Apr;19(2):94-9. PMID: 16756199
2. Ambekar A, Agrawal A, Rao R, Mishra AK, Khandelwal SK. Magnitude of Substance Use in India. New Delhi: Ministry of Social Justice and Empowerment, Government of India; 2019. on Behalf of the Group of Investigators for the National Survey on Extent and Pattern of Substance Use in India.
3. Bhullar, D. S., Singh, S. P., Thind, A. S., Aggarwal, K. K., & Goyal, A. (2013). Alcohol Drinking Patterns: A 4. Sample Study. J Indian Acad Forensic Med [serial online] Mar, 35(1), 0971-097.
4. K Vidhukumar, E Nazeer, P Anil . Prevalence and pattern of alcohol use in Kerala – A district based survey International Journal of Recent Trends in Science and Technology. March 2016; 18(2): 363-367
5. World Health Organisation. Global status report on alcohol and health 2014. 2014; 1–392.
6. International Institute for Population Sciences (IIPS) and Macro International. 2008. National Family Health Survey (NFHS-3), India 2005-06: Kerala. Mumbai: IIPS.
7. Dawson DA, Grant BF, Chou SP, Stinson FS. The impact of partner alcohol problems on women's physical and mental health. J Stud Alcohol Drugs. 2007 Jan;68(1):66-75
8. Kogan KL, Jackson JK. Stress, personality and emotional disturbance in wives of alcoholics. Q J Stud Alcohol. 1965 Sep;26(3):486-95. PMID: 5858253.
9. Bagul KR, Deshmukh SB, Bagul MK, Deshmukh PS. Psychiatric morbidity and marital quality among wives of patients with alcohol dependence syndrome. J Evid Based Med Healthc. 2015;2:3284–95
10. Padmavathi, P, Jemila, I., Devi, J., Maragatham, M., Suganya, S., & Prakash, V. Co-Dependency and Depressive Symptoms among Wives of Alcoholics Selected in Hospital, Erode. Int. J. Adv. Nur. Management 2(3): July-Sept.,2014; 143-6.
11. Nayak MB, Patel V, Bond JC, Greenfield TK. Partner alcohol use, violence and women's mental health: Population-based survey in India. Br J Psychiatry. 2010; 196: 192-199.
12. Ariyasinghe D, Abeysinghe R, Siriwardhana P, Dassanayake T. Prevalence of major depressive disorder among spouses of men who use alcohol in a rural community in Central Sri Lanka. Alcohol Alcohol. 2015;50(3):328-332.
13. Kishor M, Pandit LV, Raguram R. (2013) Psychiatric morbidity and marital satisfaction among spouses of men with alcohol dependence. Indian J Psychiatry 55:360–5.
14. Ghosh P, Victor R, Das H, Sharma S. Psychiatric morbidity and marital satisfaction: an empirical study on spouse of alcohol dependent cases in Barak valley, North-East India. Int J Res Med Sci 2017;5:1600-6.10
15. Archana, P.S.; Das, S.; Philip, S.; Philip, R.R.; Joseph, J.; Punnoose et al. prevalence of depression among middle aged women in the rural area of Kerala. *Asian J. Psychiatry* 2017, *29*, 154–159.
16. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed.

Washington, DC: American Psychiatric Association; 2013

17. Gilbody S, Richards D, Brealey S, Hewitt C: Screening for depression in medical settings with the Patient Health Questionnaire (PHQ): a diagnostic meta-analysis. J Gen Intern Med. 2007, 22: 1596-1602.
18. Poongothai S, Pradeepa R, Ganesan A, Mohan V. Reliability and validity of a modified PHQ-9 item inventory (PHQ-12) as a screening instrument for assessing depression in Asian Indians (CURES-65). J Assoc Physicians India. 2009 Feb;57:147-52. PMID: 19582982.
19. Campbell JC, Kub J, Belknap RA, Templin TN. Predictors of Depression in Battered Women. Violence Against Women. 1997; 3(3):271-293.

Research Report

DELINQUENT BEHAVIOUR AND EMOTIONAL INTELLIGENCE AMONG INMATES OF JUVENILE HOMES IN KERALA, INDIA

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ABSTRACT

Background: Delinquent behaviour represents a wide variety of law and norm violating behaviours by children. In India, statistics show that there is an increase in the rates of crimes committed by children. **Methods:** The sample of the study consisted of 100 adolescents from juvenile homes. Personal data sheet, Delinquent behaviour checklist, and Mangal Emotional Intelligence Inventory were the study tools. Mann-Whitney U test was carried out to find the association between delinquent behaviour and emotional intelligence among the inmates of juvenile homes. **Results**: Delinquent behaviour is found in 38% of children living in Juvenile homes. No significant difference is found between boys and girls in delinquent behaviour and emotional intelligence. A negative association is found between delinquent behaviour and emotional intelligence in the inmates of juvenile homes. **Conclusion:** Delinquent behaviour is found to be high among inmates of juvenile homes. A significant association was found between delinquent behaviour and emotional intelligence. Both nature and nurture are important in the development of emotional intelligence. Opportunities and training for the development and improvement of psychological faculties like emotional intelligence may impact the prevention and management of delinquent behaviour among children.

Keywords: delinquent Behaviour, emotional Intelligence, juvenile Homes

INTRODUCTION

India has a significant child and adolescent population. 40% of India's population is in the age group of 0 to 18 years.[1] India has several legislation, policies, and welfare programs to protect and safeguard its children's interests. Many governmental and non-governmental agencies working in the field of child welfare provide an array of services to ensure the safety and security of children. Despite all the legislation, policies, and programmes, children and adolescents' condition remains a cause of great concern even today. Statistics reveal that there is an increase in the rate of crimes committed by children. In the year 2018, 31,591 cases of juveniles in conflict with law were registered, which increased to 32,235 in 2019, an increase of 2%. Compared to girls, more boys were found to be apprehended. During the year 2019, a total of 38675 juveniles were apprehended.[2]

Delinquent behaviour can be considered as a term representing a wide variety of law and norm violating behaviours by children. Juvenile delinquency can be defined as "a behaviour against the criminal code committed by an individual who has not reached adulthood, as defined by state or federal law".[3]

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Juvenile Homes are operationally defined in the present study as Government Institutions established under the Juvenile Justice (care and protection of children) act 2015 by Govt. of Kerala. Children below the age of 18 who are alleged to conflict with the law and need care and protection are placed in these homes.

Many reasons explain delinquent behaviour in children. Biological, psychological, and social factors such as temperament, intelligence, emotional intelligence, psychiatric morbidity, family functioning, and peer group were implicated in delinquent behaviours.[4-10]

Studies demonstrated an association between emotional intelligence with delinquent behaviours, aggression, and callous-unemotional traits.[11-16] A clinic-based study among 114 boys reported that children with conduct problems performed poorly in emotion recognition tasks. The study demonstrated a negative correlation between conduct problems and recognising emotions such as anger, fear, and sadness.[15] Delinquent behaviours were reported more in boys in a study among 176 high school students, and the study showed that children with delinquent behaviour had difficulty in identifying feelings in others.[16]

A study of emotional intelligence among detained children reported low emotional intelligence in them. The children had a reduced capacity to recognise and perceive emotions in themselves and others. They could not use emotions accurately in their thinking, and they also had difficulty regulating their emotions.[14] People with reduced ability to understand and manage their own emotions and other people's emotions were more aggressive and were incapable of modifying their desires. They used aggression to obtain what they want.[17]

Studies reported high rates of problem behaviours among institutionalised children. The prevalence of problem behaviours was 47% in institutionalised children compared to 10.1% in the community. Labelling the institutionalised children as delinquent marginalise them and their psychological needs go unnoticed.[18]

Among children involved in the child welfare system, it was found that older children and boys were more likely to engage in delinquent behaviours than younger children and girls.[19] Delinquent behaviour, aggression, and substance use were reported in studies among school children also.[20-22]

The importance of emotion regulatory strategies in the treatment of delinquent youth was also reported [23]. The present study aims to determine whether a child's emotional intelligence has any bearing on his delinquent behaviour.

Objectives

1.To estimate the proportion of subjects having delinquent behaviour among inmates of juvenile homes.

2.To find out the Emotional Intelligence among the inmates of juvenile homes.

3. To study the relationship between Delinquent Behaviour and Emotional Intelligence among the inmates of juvenile homes.

Hypothesis

There will be an association between Delinquent Behaviour and Emotional Intelligence among inmates of juvenile homes.

MATERIALS AND METHODS

A descriptive research design was used for the study. The sample of the study consisted of 100 adolescents selected randomly from juvenile homes. The investigator obtained permission from the social welfare department of the Kerala state to collect data from institutions under the department. (SPSU 4/16463/14 dated 27/05/2014.) Ethical clearance was obtained from the Institutional Ethics Committee of IQRAA International Hospital and Research Centre, Calicut. Personal data sheet, Delinquent behaviour checklist, adapted from the misbehaviour questionnaire [24] and Mangal Emotional Intelligence Inventory[25] were the tools used for the study. The adapted delinquent behaviour checklist and Mangal Emotional Intelligence Inventory were translated into the vernacular language and validated. Permission from concerned authorities of selected juvenile homes was obtained. Consent was obtained from adolescents who choose to participate in the study. The investigator explained the study in short to the children and requested their cooperation. Personal data of children were collected using a personal data sheet. The investigator interviewed each of the participants individually to assess delinquent behaviour with the help of the delinquent behaviour checklist. The participants completed the Mangal

Emotional Intelligence Inventory by themselves. Statistical analysis was done using the SPSS package. Kolmogorov-Smirnov test was used to test whether the data were normally distributed. The data was found non-normal. Mann-Whitney U test was carried out to find the association between delinquent behaviour and emotional intelligence among inmates of juvenile homes.

RESULTS

Delinquent behaviour is found in 38% of children living in Juvenile homes. No significant difference is found between boys and girls in delinquent behaviour. 28 of the 72 boys (38.9%) and 10 of the 28 girls (35.7%) show delinquent behaviour. The mean score of emotional intelligence is 54.22, and the median score is 55 in boys. The mean score of emotional intelligence is 58.57, and the median score is 57 in girls. There is no significant difference between boys and girls of juvenile homes in the total score of emotional intelligence. A significant difference between boys and girls is found in the interpersonal management subscore of emotional intelligence. A negative association is found between delinquent behaviour and emotional intelligence in the inmates of juvenile homes. The subscores and the total score of emotional intelligence are found high among children without delinquent behaviour. A significant difference is found in the total score and all the subscores except that of interpersonal awareness score of emotional intelligence between children with and without delinquent behaviour.

Table 1. Comparison between boys and girls in the prevalence of delinquent behaviour among the inmates of juvenile homes

Delinquent Behaviour	Boys (%) (n=72)	Girls (%) (n=28)	Chi-Square	p-value
Present	28(38.9)	10(35.7)	0.086	0.769
Absent	44(61.1)	18(64.3)		

DISCUSSION

Emotional intelligence is the ability to engage in sophisticated information processing about one's own and others' emotions and the ability to use this information as a guide to thinking and behaviour. Individuals high in emotional intelligence pay attention to, use, understand and manage emotions, and these skills serve as adaptive functions that potentially benefit themselves and others.[26] Earlier studies reported an association between delinquent behaviour and emotional intelligence. Low emotional intelligence was found in adolescents and adult offenders.[13, 27-28] The findings of the present study also demonstrated a negative association between delinquent behaviour and emotional intelligence.

Table 2. Comparison of domain scores of emotional intelligence between boys and girls among the inmates of juvenile homes

Domains of emotional intelligence	Boys (n=72) Median (IQR)	Girls (n=28) Median (IQR)	Mann Whitney U value	Z	p-value
Intrapersonal awareness	14.00 (4.00)	14.50 (4.75)	904.5	-0.798	0.425
Interpersonal awareness	12.50 (5.75)	14.00 (5.50)	811.5	-1.517	0.130
Intrapersonal management	15.00 (4.00)	14.00 (5.75)	913.0	-0.733	0.463
Interpersonal management	14.00 (5.00)	17.00 (6.50)	673.0	-2.583	0.010*
Total Emotional Intelligence	55.00(12.00)	57.00(20.50)	807.0	-1.544	0.123

* significant at 0.05 level. IQR-interquartile range

Table 3. Association between delinquent behaviour and emotional intelligence among the inmates of juvenile homes

Domains of emotional intelligence	Delinquent Behaviour Median (IQR)	No delinquent behaviour Median (IQR)	Mann Whitney U value	Z	p-value
Intrapersonal awareness	13.00 (5.00)	14.00 (4.00)	780.0	-2.840	0.005**
Interpersonal awareness	13.00 (3.00)	13.00 (5.25)	1082.5	-0.682	0.495
Intrapersonal management	15.00 (6.00)	16.00 (5.00)	881.0	-2.120	0.034*
Interpersonal management	14.00 (4.25)	16.00 (5.00)	799.0	-2.703	0.007**
Total Emotional Intelligence	53.00 (13.25)	58.00 (14.25)	808.0	-2.630	0.009**

*Significant at 0.05 level, ** significant at 0.01 level, IQR-interquartile range

Delinquent behaviour is found to be high among inmates of Juvenile Homes. This finding is consistent with other studies,[18,20] and is expected as children who conflict with the law and those who need care and protection due to neglect or maltreatment are placed in juvenile homes. Studies reported an association between maltreatment and the ability to regulate emotions.[29] The ability to understand other's thoughts and intentions is limited in maltreated children.[30] Maltreated children demonstrated increased emotional reactivity. They usually act impulsively in response to distress.[31] Among delinquent boys, associations were demonstrated between maltreatment, emotional dysregulation, and psychopathic traits.[9]

The capacity to recognise emotions were found to be bad in adolescents with conduct problems.[15] The reduced capacity of adolescents to identify feelings of others debilitates their ability to understand how the offending behaviour is likely to make others feel.[14] Difficulty to identify feelings was reported as a significant predictor of interpersonal delinquency.[16] The difficulty might hinder the person's ability to employ a sense of remorse for the delinquent behaviour in using emotions to facilitate thinking.[14] People with low levels of emotional intelligence were unable to understand and manage one's own and others' emotions. They were aggressive and used aggression to obtain what they intend to achieve.[17] A negative correlation was reported between emotional intelligence and anger [32].

A reduced capacity to regulate emotions may have a role in maintaining the offending patterns of behaviour. Here the offending behaviour itself becomes a way to regulate the negative emotion.[14] Studies demonstrated that emotion dysregulation increases aggressive behaviour [33] The ability to manage emotions was found to correlate with impulsivity and hasty responses negatively.[34]

No difference was seen between boys and girls in delinquent behaviour. Almost all the studies reviewed have reported that boys exhibit more delinquent behaviour than girls.[7,9,19] Hence, the finding of the study is unique and interesting. It is against the general notion that boys exhibit more delinquent behaviour than girls. The finding may be due to the change in the socio-cultural environment in the present society. The impact of globalisation, the advancement of new technologies, exposure to the wider world, the freedom enjoyed by the girls, and the changes in the value system, etc., may be the reasons for the girls to engage in delinquent behaviour like boys.

Other studies reported no significant association between emotional intelligence scores and gender, showing an agreement with the present study's findings.[16, 35] Several psychosocial factors contribute to the development of emotional intelligence. Stimulating a psychosocial environment, good quality caregiving, adequate educational opportunities, etc., are most common among them.

Kerala state is known for its gender equality and freedom of choice for girls. The educational facilities, exposure to the wider world, and other opportunities are provided to boys and girls almost in the same manner. This may be the reason why boys and girls do not differ in emotional intelligence.

Conclusion

Delinquent behaviour is found to be high among inmates of juvenile homes. A significant association was found between delinquent behaviour and emotional intelligence. Both nature and nurture are important in the development of emotional intelligence. Opportunities and pieces of training for the development and improvement of psychological faculties like emotional intelligence may impact the prevention and management of delinquent behaviour among children.

Limitations

- Result may not generalise to all children and adolescents showing delinquent behaviours.
- The sample of delinquent children was treated as a single unit irrespective of their delinquent behaviour's types and gravity.
- The study included children aged 15 to 18 years only, as the administration of all tools was not possible with other age groups of children.
- Sample was selected without considering the criminal history or psychiatric history of their parents.

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REFERENCES

1. Satpathy C. Child Welfare Policies and Programmes in India [Internet]. Insightsonindia.com. 2012 [cited 28 July 2020]. Available from: http://www.insightsonindia.com/wp-content/uploads/2013/09/child-welfare-policies-and-programs-in-india.pdf.
2. Crime in India 2019 [Internet]. Ncrb.gov.in. 2020 [cited 26 December 2020]. Available from: https://ncrb.gov.in/sites/default/files/CII%202019%20Volume%201.pdf
3. Bartol C, Bartol A. Criminal Behaviour: A Psychological approach. 9th ed. NJ: Pearson Education Limited; 2011.
4. Murray J, Farrington D. Risk Factors for Conduct Disorder and Delinquency: Key Findings from Longitudinal Studies. The Canadian Journal of Psychiatry. 2010;55(10):633-42.
5. Massetti G, Vivolo A, Brookmeyer K, DeGue S, Holland K, Holt M et al. Preventing Youth Violence Perpetration Among Girls. Journal of Women's Health. 2011;20(10):1415-28.
6. Lösel F, Farrington D. Direct Protective and Buffering Protective Factors in the Development of Youth Violence. American Journal of Preventive Medicine. 2012;43(2): S8-S23.
7. Jayaprakash R, Rajamohanan K, Anil P. Determinants of symptom profile and severity of conduct disorder in a tertiary level pediatric care set up: A pilot study. Indian J Psychiatry. 2014;56:330-6.
8. Dória G, Antoniuk S, Assumpção Junior F, Fajardo D, Ehlke M. Delinquency and association with behavioral disorders and substance abuse. Revista da Associação Médica Brasileira. 2015;61(1):51-57.
9. Sevecke K, Franke S, Kosson D, Krischer M. Emotional dysregulation and trauma predicting psychopathy dimensions in female and male juvenile offenders. Child and Adolescent Psychiatry and Mental Health. 2016;10:43
10. Sathyanarayana Rao T. Criminal behavior: A dispassionate look at parental disciplinary practices. Indian Journal of Psychiatry. 2007;49(4):231.
11. García-Sancho E, Salguero J, Fernández-Berrocal P. Ability emotional intelligence and its relation to aggression across time and age groups. Scandinavian Journal of Psychology. 2016;58(1):43-51.
12. Kahn R, Ermer E, Salovey P, Kiehl K. Emotional Intelligence and Callous–Unemotional Traits in Incarcerated Adolescents. Child Psychiatry & Human Development. 2016;47(6):903-17.
13. Curci A, Soleti E, Manuti A. Preliminary Data on the Role of Emotional Intelligence in Mediating the Relationship Between Psychopathic Characteristics and Detention Terms of Property Offenders. Journal of Forensic Sciences. 2017;62(5):1357-1359.
14. Hayes J, O'Reilly G. Emotional intelligence, mental health and juvenile delinquency. Cork: Juvenile Mental Health Matters; 2007. Retrieved 18 March 2018, from: https://www.drugsandalcohol.ie/6264/1/Emotional_intelligence.pdf.
15. Aspan N, Vida P, Gadoros J, Halasz J. Conduct Symptoms and Emotion Recognition in Adolescent Boys with Externalisation Problems. The Scientific World Journal. 2013;2013:1-6.
16. Berastegui C, van Leeuwen N, Chabrol H. Relations entre intelligence émotionnelle, alexithymie et comportements délinquants de type interpersonnel dans un échantillon d'adolescents scolarisés. L'Encéphale. 2012;38(5):426-432.
17. Lanciano T, Curci A, Guglielmi F, Soleti E, Grattagliano I. Preliminary Data on the Role of Emotional Intelligence in Moderating the Link between Psychopathy and Aggression in a Nonforensic Sample. Journal of Forensic Sciences. 2017;63(3):906-10.
18. Erol N, Simsek Z, Münir K. Mental health of adolescents reared in institutional care in Turkey: challenges and hope in the twenty-first century. European Child & Adolescent Psychiatry. 2009;19(2):113-124.
19. Grogan-Kaylor A, Ruffolo M, Ortega R, Clarke J. Behaviors of youth involved in the child welfare system. Child Abuse & Neglect. 2008;32(1):35-49.
20. Kumari S. A Cross-Sectional Study of Aggression among School Adolescents in Karnataka, India. Indian Journal of Youth and Adolescent Health [Internet]. 2018;04(04):4-9.
21. Pal R, Dasgupta A, Tsering D. Substance use among adolescent high school students in India: A survey of knowledge, attitude, and opinion. Journal of Pharmacy And Bioallied Sciences. 2010;2(2):137.
22. Na K, Lee S, Hong H, Oh M, Bahn G, Ha K et al. The influence of unsupervised time on elementary school children at high risk for inattention and problem behaviors. 2014;38(6):1120-27
23. Winiarski D, Schechter J, Brennan P, Foster S, Cunningham P, Whitmore E. Adolescent Physiological and Behavioral Patterns of Emotion Dysregulation Predict Multisystemic Therapy Response. Journal of Emotional and Behavioral Disorders. 2016;25(3):131-42.
24. Reavy R, Stein L, Paiva A, Quina K, Rossi J. Validation of the delinquent activities scale for incarcerated adolescents. Addictive Behaviors. 2012;37(7):875-79.
25. Mangal K, Mangal S. (2004). Manual for Mangal emotional intelligence inventory. Agra: National Psychological Corporation.

26. Mayer J, Salovey P, Caruso D. Emotional Intelligence: Theory, Findings, and Implications. Psychological Inquiry. 2004;15(3):197-215.
27. Ermer E, Kahn R, Salovey P, Kiehl K. Emotional intelligence in incarcerated men with psychopathic traits. Journal of Personality and Social Psychology. 2012;103(1):194-204.
28. Sharma N, Prakash O, Sengar K, Chaudhury S, Singh A. The relation between emotional intelligence and criminal behavior: A study among convicted criminals. Industrial Psychiatry Journal. 2015;24(1):54.
29. Kim J, Cicchetti D. Longitudinal pathways linking child maltreatment, emotion regulation, peer relations, and psychopathology. Journal of Child Psychology and Psychiatry. 2009;51(6):706-716.
30. Benarous X, Guilé J, Consoli A, Cohen D. A systematic review of the evidence for impaired cognitive theory of mind in maltreated children. Frontiers in Psychiatry. 2015;6.
31. Heleniak C, Jenness J, Stoep A, McCauley E, McLaughlin K. Childhood Maltreatment Exposure and Disruptions in Emotion Regulation: A Transdiagnostic Pathway to Adolescent Internalizing and Externalizing Psychopathology. Cognitive Therapy and Research. 2016;40(3):394-415.
32. Faye A, Kalra G, Swamy R, Shukla A, Subramanyam A, Kamath R. Study of emotional intelligence and empathy in medical postgraduates. Indian Journal of Psychiatry. 2011;53(2):140-4.
33. McLaughlin K, Hatzenbuehler M, Mennin D, Nolen-Hoeksema S. Emotion dysregulation and adolescent psychopathology: A prospective study. Behaviour Research and Therapy. 2011;49(9):544-54.
34. Checa P, Fernández-Berrocal P. The Role of Intelligence Quotient and Emotional Intelligence in Cognitive Control Processes. Frontiers in Psychology. 2015;6:1853.
35. Ravikumar R, Rajoura O, Sharma R, Bhatia M. A Study of Emotional Intelligence Among Postgraduate Medical Students in Delhi. Cureus. 2017;. 9(1):e989

Research Report

ATTITUDE TOWARDS DRUG ADHERENCE IN INPATIENTS WITH BIPOLAR AFFECTIVE DISORDER: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background and Objectives: Bipolar Affective Disorder is the sixth leading cause of disability-adjusted life years in individuals aged 15-44 years. Among the patients with bipolar disorder, about 60% are at least partially non-adherent to medications. This study attempted to study attitude towards drug adherence in inpatients with bipolar affective disorder. **Materials and Methods:** Consecutive patients, between 18 to 60 years of age, diagnosed with Bipolar Affective Disorder, undergoing inpatient treatment over a two-month period, were recruited. Their attitude towards drug adherence was assessed using a 30-item version of the Drug Attitude Inventory (DAI). **Results:** Subjects in this study had good medication adherence (DAI= 3.12± 7.09), indicating these patients tended to report favourable views towards their psychiatric medications. **Conclusion:** Assessment of attitude towards non-adherence in this population showed good medication adherence and a positive response to treatment.

Keywords: non-adherence, drug attitude, bipolar affective disorder

INTRODUCTION

According to the WHO, Bipolar Affective Disorder is the sixth leading cause of disability-adjusted life years in individuals aged 15-44 years.[1] It is among the most debilitating mental disorders in India, with a percentage of total DALYs being 6.9% in 2017.[2] It is therefore no longer sufficient to focus treatment on the symptoms of acute episodes, but also to understand the course of the illness, reduce chronicity by preventing or delaying episode recurrence and develop timely interventions by optimising treatment strategies.[3]

The WHO has defined treatment adherence as "the extent to which a person's medication taking behaviour, following a diet, and or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.[4] Among the patients with Bipolar Disorder, about 60% are at least partially non-adherent to medications.[5] From a retrospective chart review done in India, 82.7% of patients were found to have a history of noncompliance.[6] According to a study on Indian patients suffering from mental disorders, better adherence was seen among educated patients and those with parental social support.[7] A study from South India observed that occupational status and length of hospital stay were predictive of high medication adherence. Drug attitude scores and the number of depressive episodes had positive and negative associations, respectively, with high medication adherence.[8] Compliance with medications is one of the most

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significant factors that can decrease the rate and severity of relapse and positively impact the overall prognosis.[9] Noncompliance and subsequent failure to follow up can result in deterioration in their mental state. Noncompliance is strongly related to clinical outcomes such as relapse, rehospitalisation, and suicide attempts in schizophrenia and bipolar disorder.[10]

Bipolar Affective Disorder is a major public health problem with frequent relapses and recurrences. Inadequate treatment causes a significant morbidity and mortality risk. Keeping these factors in mind, it is necessary to systematically analyse the determinants of non-adherence in our community. The objective of the study was to determine the attitude of inpatients with Bipolar Affective Disorder towards drug adherence.

METHODS

A cross-sectional study was conducted in consecutive IP patients in the psychiatry ward of a tertiary care centre in Kerala, India, over a duration of 2 months (2018). The study included patients in the age group 18-60 years, admitted in the psychiatry ward with bipolar affective disorder, diagnosed as per International Classification of Diseases ICD10, following clinical interview, during the study period. Those with intellectual disability and those who were unwilling to give consent or were uncooperative were excluded from the study.

Assuming alpha error at 0.5% and 8% precision, the sample size of 63 was calculated based on a similar study.[11] Approval was obtained from Institutional Review Board before the study. A questionnaire pertaining to demographic details and the clinical data was given to the patient and bystander, and the information extracted was entered in the data collection sheet.

The attitude towards drug adherence was assessed using a 30-item version of the Drug Attitude Inventory (DAI). It includes a series of questions, each with true/false answers, pertaining to various aspects of the patient's perceptions and treatment experiences. The DAI-30 contains 15 items that a patient who is fully adherent to their prescribed medication (and so would be expected to have a 'positive' subjective response to medication) would answer as 'True', and 15 items such a patient would answer as 'False'. To calculate the score from a set of answers, each 'positive' answer is given a score of plus one, and each 'negative' answer is given a score of minus one. The total score for each patient is calculated as the sum of the positive scores minus the negative scores. A positive total score indicates a positive subjective response (adherent), and a negative total score indicates a negative subjective response (non-adherent).

The patients responded to the questionnaire, which was translated to Malayalam.

RESULTS

Table 1: Sociodemographic and illness-related variables

Variable	Count (%)
Gender	
Male	38(60.30%)
Female	25(39.70%)
Marital status	
Married	34(54.6%)
Unmarried, divorced, separated, widow/ widower	29(45.4%)
Duration of illness	
Illness for < 10 years	16(25.40%)
Illness for > 10 years	47(74.60%)
Supervision of medications	
Supervised	30(47.60%)
Unsupervised	33(52.40%)
Medication adherence (DAI)	
Adherent	44(69.80%)
Non-adherent	19(30.20%)

The study was conducted in a sample size of 63 individuals with Bipolar affective disorder. The age of the patients in the sample ranged from 18 years to 54 years. 52.4% of patients were on unsupervised medications, 54% with a significant stressor in the recent past. On assessing drug adherence based on Drug attitude inventory, 69.8% were adherent to medications, showing a positive response towards treatment (Table 1). Approximately 70 % showed a positive response towards the treatment. The subjects in our study had good medication adherence showing a mean of 3.21 and a standard deviation of 7.096 with a minimum adherence score of – 19 and a maximum of 15.

We performed simple logistic regression on six variables to assess for possible predictors of non-adherence. These were: age, marital status, number of episodes, supervised or unsupervised medications, presence of any recent stressors and comorbid substance use. The binary dependent variable used was patients with a positive and negative attitude towards medications assessed by Drug Attitude Inventory. Multiple logistic regression revealed that none of the variables was significantly associated with non-adherence.

DISCUSSION

The study shows that most patients diagnosed with bipolar affective disorder were between 35 and 44 years of age. The subjects in our study had good medication adherence (3.12± 7.09), indicating these patients tended to report favourable views towards their psychiatric medications.

Most of the patients were males (60.3%), as against studies by Ballyram et al. and Merikangas et al. (2007), where most patients were females.[12] Approximately three-fourths of the patients had been ill for more than ten years (74.6%), and this is consistent with other studies demonstrating the chronicity of bipolar disorder. 44% of the study population had a family history of mental illness, consistent with other studies that found 40% prevalence.[13]

Estimates of the frequency of non-adherence to antipsychotic medication vary, with review studies suggesting the rate lies between 25 and 55%.[14,15] A study conducted on psychiatric patients showed a mean medication adherence of 8.40 and a standard deviation of 1.49 with a median of 9.00.[16] In another study, medication adherent patients showed a statistically significant higher mean DAI score (5.3± 4.4).[17] On contrary to these findings, a high level of negative attitude (78.5%) with mean± SD of -1.705± 3.58 towards medication is observed in another study.[18]

Although not significant (p> 0.05%) in our study, the sociodemographic and psychiatric data were slightly positively correlated. It is possible that a larger sample size would help determine the association between these variables.

The limitation of the study was our small sample size which may have limited our power to detect a correlation of non-adherence with sociodemographic and psychiatric data. Lack of structured interview, cross-sectional nature of the study, lack of external validity were few other limitations.

CONCLUSION

Non- adherence to medication regimens is a serious problem. It has many serious effects on the prognosis of the illness and the overall effectiveness of health interventions. Increasing the effectiveness of adherence interventions may have a far greater impact on the health of the population than any improvement in specific medical treatments.

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Conflicts of interest

There are no conflicts of interest.

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REFERENCES

1. Berk M, Dodd S, Berk L, et al. Diagnosis and management of patients with bipolar disorder in primary care. Br J Gen Pract. 2005;55(518):662–664
2. Sagar R, Dandona R, Gururaj G, Dhaliwal R, Singh A, Ferrari A et al. The burden of mental disorders across the states of India: the Global Burden of Disease Study 1990–2017. The Lancet Psychiatry. 2020;7(2):148-161.
3. Judd LL, Schettler PJ, Akiskal HS, et al. Residual Symptom Recovery From Major Affective Episodes in Bipolar Disorders and Rapid Episode Relapse/Recurrence. Arch Gen Psychiatry. 2008;65(4):386–394. doi:10.1001/archpsyc.65.4.386
4. World Health Organization. Adherence to Long Term Therapy: Evidence for Action. Geneva: World Health Organization; 2003.
5. Gaudiano BA, Weinstock LM, Miller IW. Improving treatment adherence in bipolar disorder: a review of current psychosocial treatment efficacy and recommendations for future treatment development. Behavior Modification. 2008; 32:267–301.
6. Narayanan D, Jith A, Bansal R. Nonadherence in bipolar disorder patients: A 14-year retrospective study. Indian J Psychiatry 2020; 62:290-4

7. Sharma S, Kumar N, Chakraborti S, Sinha S, Kumari S, Gajendragad JM. Prevalence and factors associated with medication compliance in Indian patients suffering from mental disorders. Trop Doct. 2012 Jan;42(1):28-31. doi: 10.1258/td.2011.110009. Epub 2011 Oct 28.
8. Selvakumar, N., Menon, V., & Kattimani, S. (2018). A Cross-sectional Analysis of Patterns and Predictors of Medication Adherence in Bipolar Disorder: Single Center Experience from South India. Clinical psychopharmacology and neuroscience: the official scientific journal of the Korean College of Neuropsychopharmacology, 16(2), 168–175.
9. Muneer A. Staging Models in Bipolar Disorder: A Systematic Review of the Literature. Clinical Psychopharmacology and Neuroscience. 2016;14(2):117-130.
10. Velligan DI, Weiden PJ, Sajatovic M, Scott J, Carpenter D, Ross R, et al. The expert consensus guideline series: Adherence problems in patients with serious and persistent mental illness. J Clin Psychiatry 2009;70 Suppl 4:1-46.
11. Ramachandran A, Ramanathan R, Praharaj S, Kanradi H, Sharma P. A Cross-sectional, Comparative Study of Insight in Schizophrenia and Bipolar Patients in Remission. Indian Journal of Psychological Medicine. 2016;38(3):207-212.
12. Hogan TP, Awad AG, Eastwood R. A self-report scale predictive of drug compliance in schizophrenics: Reliability and discriminative validity. Psychological Medicine. 1983; 13:177–183.
13. Merikangas KR, Akiskal HS, Angst J, Greenberg PE, Hirschfeld RMA, Petukhova M, et al. Lifetime and 12-month prevalence of bipolar spectrum disorder in the National Comorbidity Survey replication. Arch Gen Psychiatry. 2007 May;64(5):543–52.
14. Cramer JA and S. Patient Compliance in Medical Practice and Clinical Trials [Internet]. eweb:104177. 1991 [cited 2018 Oct 17]. Available from: https://repository.library.georgetown.edu/handle/10822/842825
15. Poor adherence to long-term treatment of chronic diseases is a worldwide problem. Revista Panamericana de Salud Pública. 2003;14(3):218-221.
16. Manic-Depressive Illness: Bipolar Disorders and Recurrent Depression. Second Edition. Oxford, New York: Oxford University Press; 2007. 1288 p.
17. Blackwell B. Treatment Adherence. Br J Psychiatry. 1976 Dec;129(6):513–31
18. Forman L. Medication: reasons and interventions for noncompliance. J Psychosoc Nurs Ment Health Serv. 1993 Oct;31(10):23–5.

Research Report

THE PROFILE OF SUBCLINICAL HYPOTHYROIDISM IN SUBJECTS WITH PREMENSTRUAL DYSPHORIC DISORDER -A PILOT STUDY

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ABSTRACT

Background: Psychiatric disorders are usually found to be associated with thyroid dysfunction. Although thyroid dysfunction's relevance to psychiatric disorders is recognised, few studies have estimated the prevalence of subclinical hypothyroidism in subjects with the premenstrual dysphoric disorder in the Indian population. **Method**: A hospital-based cross-sectional study conducted in a tertiary care centre in central Kerala enrolled 70 subjects diagnosed with Premenstrual Dysphoric Disorder (PMDD) who presented to the psychiatry and gynaecology Outpatient Departments (OPD). Sociodemographic and clinical data were collected, followed by the administration of the PMDD rating scale. Mini International Psychiatric Interview was done to rule out other psychiatric disorders. TSH was done for all subjects after two months during follow up. **Results**: 63.33 % of subjects with PMDD were found to have thyroid dysfunction. A significant association was established between PMDD score and subclinical hypothyroidism. **Conclusion**: Subclinical hypothyroidism is common in premenstrual disorder and is closely associated with the same.

Keywords: thyroid dysfunction, premenstrual dysphoric disorder

INTRODUCTION

Premenstrual syndrome is defined as a recurring pattern of symptoms during the premenstrual phase and declines soon after the onset of menses. It is characterised by physical, affective and behavioural symptoms that significantly affect the daily life of women. With at least one disabling affective symptom to the extent of causing marked functional impairment, women with severe symptoms are characterised as premenstrual dysphoric disorder. The symptoms must be present for one to two weeks premenstrually with relief by day 4 of menses and should be documented prospectively for at least two cycles using a daily rating form.[1]

Menstrual irregularities tend to be more frequent in severe hypothyroidism.[2] 3-8% of women are estimated to have PMDD. In a subset of women, thyroid axis abnormalities contribute to their Premenstrual disorder.[3] Symptoms of PMS can be very similar to those of disorders like depression and anxiety. Hence a prospective evaluation is required for making a diagnosis of both PMDD and thyroid dysfunction.[3]

Not many studies have estimated the prevalence of thyroid dysfunctions in subjects with PMDD in the Indian population. Although the relevance of thyroid dysfunction to bipolar disorder and other psychiatric disorders is recognised, the association between thyroid dysfunction and PMDD is under-emphasised. The aims of our study are; 1) to estimate the proportion of subjects

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with PMDD having thyroid dysfunctions and 2) to assess the association between thyroid dysfunction and family history of PMDD.

MATERIALS AND METHODS

This pilot study was planned for a period of 6 months. All subjects presenting to tertiary care hospitals with PMDD symptoms during the study period were enrolled in convenience sampling.

Inclusion criteria

All subjects between 12 to 45 years of age presenting to psychiatry OPD and gynaecology OPD with symptoms suggestive of PMDD.

Exclusion criteria

1. Lack of willingness or capacity to provide informed consent to participate in the study

2. Pregnant women

3. Subjects with psychiatric disorders other than premenstrual dysphoric disorder.

4. Subjects already diagnosed with hypothyroidism, on replacement therapy

5. Subjects already on any hormone replacement therapy (progesterone and estrogen)

6. Women with irregular menstrual cycles

(Irregular menstrual cycle- The menstrual cycles are either shorter than 21 Days or longer than 36 days regularly.)

Approval from the Institutional Ethics Committee was sought before the commencement of the study. All subjects presenting to psychiatry and gynaecology OPD fulfilling the inclusion and exclusion criteria were included after taking a written informed consent or assent along with parental consent (if the subject was less than 18 years ago). Sociodemographic and clinical data were collected from each of the subjects, followed by the administration of MINI International Psychiatric Interview to rule out any comorbid psychiatric disorders. MINI is a short structured diagnostic interview developed to assess the diagnosis of psychiatric patients according to DSM 1V and ICD- 10 criteria in less time than other diagnostic interviews.[5] The scale was used to rule out other psychiatric disorders. The instrument was translated to Malayalam and retranslated to English. Simultaneously DRSP (daily record of severity of problems was given for self-rating. It was explained to each of the subjects in their native language, following which the subjects were to administer the scale by themselves for a period of 2 months. DRSP is a prospective and self-administered questionnaire that is the most accepted and widely used system for PMDD diagnosis. The diagnosis was confirmed only after reviewing the data recorded for two months by the patient. The scale was translated to Malayalam and retranslated to English. Malayalam version of the scale was used to assess PMDD in seven subjects before the commencement of the study and was found to be well understood.

A fasting TSH (Thyroid Stimulation Hormone) test was performed two months after follow-up, as two months were required to confirm PMDD diagnosis. The Institute grant for research bore the cost of the test. The subject was referred to the General Medicine department if detected to have altered TSH level.

The data was collected, and statistical analysis was done using SPSS 17 Version. A p-value of <0.5 was considered significant. The percentage of thyroid dysfunctions in subjects with PMDD was estimated. Categorical data were assessed using the chi-square test.

RESULTS

In the total of 60 subjects enrolled on the study, 22 (36.7%) subjects were diagnosed to have mild PMDD and 23 (38.3%) with moderate PMDD and 15(25%) with severe PMDD, respectively. The majority of the subjects, 50 (83.3%) with PMDD, were between the age group of 18-30 years. 43 (71.7%) were married, and most 28 (46.7%) were hailed from nuclear families. 52 (87%) of subjects with moderate ad severe PMDD were diagnosed with subclinical hypothyroidism

To determine whether there is any relationship between subclinical hypothyroidism and varying degrees of PMDD, we first classified the PMDD score into three categories: mild, moderate, and severe (Table-1). The Chi-square test was applied, which showed a p-value of 0.002 (Chi= 12.49) and was found to be significant.

Table 1. Association between PMDD Score and hypothyroidism

.		Categories of PMDD score			Chi-square value	p-value
		Mild	Moderate	Severe		
Subclinical Hypothyroidism	Yes	8	20	10	12.49	0.002*
	No	14	3	5		
History of Hypothyroidism	Yes	8	10	6	0.008	0.928
	No	14	13	9		

PMDD- premenstrual dysphoric disorder, *p<0.05

Analysing the relationship between family history of thyroid dysfunction and PMDD score showed a p-value of 0.888 (Chi = 0.237), suggesting no significant association (Table-2). A significant association was established between PMDD score and thyroid dysfunction. No meaningful relationship was found between thyroid dysfunction and family history of PMDD with a p-value of 0.928 among subjects with PMDD (Chi = 0.008).

DISCUSSION

This Pilot Study was initiated to estimate the proportion of subclinical hypothyroidism in PMDD, as there was a paucity of data in our setting. A large proportion of subjects with PMDD were found to have thyroid dysfunction. However, correlation with variables like a family history of PMDD and thyroid dysfunction were not significant. A large-scale study conducted in Korea revealed a significant association between PMDD and suicidality.[6] Hence, understanding the modifiable endocrine factors will contribute to better plan management strategies for such patients.

Thyroid dysfunction is an important Important aetiological factor for menstrual abnormalities. A study by Thomas et al. revealed that the high incidence of thyroid hypofunction previously reported in PMS was due to an unusually low TSH level for the limit of the normal range for the TRH stimulation test.[7] Hence a larger sample size is required for a better understanding of the same.

Thyroid illnesses produce some psychiatric symptoms, and there is a frequent association of thyroid dysfunction with mood disorders. Therefore, routine thyroid function assessment in patients with mood disorders and the treatment of sub-clinical thyroid dysfunction is recommended. Adding thyroid hormones to antidepressant treatment in euthyroid patients to obtain a potentiation effect has been probed repeatedly. The most common strategy is potentiation with T3, but high doses of T4 have also been used in patients with resistant depression. Thyroid hormones exert their action in the central nervous system through various mechanisms: modulation of gene expression of several groups of proteins, some of them with known physio-pathological implications in mood disorders and the influence over serotonin noradrenergic neurotransmitter dysfunction.[8] PMDD includes disabling affective symptoms; hence better management of PMDD could be possible with simultaneous correction of any thyroid dysfunction. Also, the possibility of augmenting T3 for such patients could be tried.

A better emphasis on identifying and treating PMDD and regular thyroid status evaluation can provide a better prognosis for patients. Assessment of thyroid function should be done in all patients with premenstrual syndrome.

The major limitation of this study is that it is a pilot study with a limited sample size owing to the paucity of data on the topic from the study setting. Hence generalizability of the results is not possible.

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REFERENCES

1. Heinemann LA, Minh TD, Filonenko A, Uhl-Hochgräber K. Explorative evaluation of the impact of severe premenstrual disorders on work absenteeism and productivity. Women's Health Issues 2010; 20(01):58-65
2. Nevatte T, O'Brien PM, Bäckström T, Brown C, Dennerstein L, Endicott J, et al.; Consensus Group of the International Society for Premenstrual Disorders. ISPMD consensus on the management of premenstrual disorders. Arch Women Ment Health 2013; 16(04):279-91
3. Susan S Girdler, Cort A Pederson, Kathleen C Light; Thyroid axis function during the menstrual cycle in women with PMS Psychoneuroendocrinology. 1995;20(4):395-403.
4. Halbreich U, Borenstein J, The prevalence, impairment, impact, and burden of premenstrual dysphoric disorder (PMS/PMDD). Psychoneuroendocrinology 2003 Aug;28 Suppl 3:1-23.
5. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, et al. The Mini-International Neuropsychiatric Interview (MINI): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10 J Clin Psychiatry. 1998;59 Suppl 20:22-23
6. Hong JP, Park S, Wang HR, Chang SM, Sohn JH, Jeon HJ, et al. Prevalence, correlates, comorbidities and suicidal tendencies of PMDD in a nationwide sample of Korean women. Soc Psychiatry Psychiatr Epidemiol. 2012 Dec;47(12):1937-45
7. Thomsen AF, Kvist TK, Andersen PK, Kessing LV. Increased risk of developing affective disorder in patients with hypothyroidism: A register-based study. Thyroid. 2005; 15:700–7.
8. Danilo Q, Gloger S, Valdivieso S, Ivelic J, Fardella C. [Mood disorders, psychopharmacology and thyroid hormones]. Rev Med Chil. 2004 Nov;132(11):1413-24.

Research Report

AN INTERACTIVE WORKSHOP ON WRITING AND PUBLISHING RESEARCH: REFLECTIONS AND LESSONS LEARNED

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ABSTRACT

Publishing research is an essential skill for health professionals. In India, few training programs are specifically aimed to improve scientific writing. We developed a two-day interactive training workshop to address the need of the researchers. Methods such as targeted Facebook advertising and sending emails to available collections of addresses were used to inform potential participants from diverse disciplines about the program. There were 48 participants from 15 disciplines. Half of them were females, and half were from Psychiatry. We reflected on the content and experience of the workshop and have summarized the lessons learned from it. The participants perceived the workshop to be useful and found the experience satisfying.

Keywords: scientific writing, publishing, workshop, interactive

INTRODUCTION

Publications are the proxy markers for the research output of health professionals. For the faculty, they are also an academic requirement for promotions and other incentives. Little formal training in scientific writing is available even in academic institutions. Writing papers is dreaded by many, especially young faculty. Because of this lack of training, the submitted papers are of poor quality and face rejections. Menon et al.[1] have identified several errors in the submitted manuscripts, ranging from methodological flaws to poor language. Therefore, there is a need for formal training programs to improve manuscript writing.

Although several courses on research methodology are around, very few courses on scientific writing for health professionals are available. Most successful researchers develop their writing skills by doing it themselves, without receiving any formal training.

However, because of inadequate training, most early researchers are reluctant to write. We developed a two-day interactive workshop where we were the organizers and resource persons to address this need. The workshop, whose theme was "Writing and Publishing Research Papers," specifically focused on early career professionals. It was held on January 4 and 5, 2020, at St. Thomas College of Nursing, Changanacherry, Kerala, India.

In this paper, we reflected on the conduct of the workshop. Specifically, we aimed to a) describe the planning and implementation of the workshop, b) evaluate the workshop using post-test and feedback

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from the participants, and c) identify strengths and weaknesses of the workshop and ways to improve it. Written or oral consent was obtained from all the participants through email or phone.

METHODS & RESULTS

Finding the participants

To facilitate active participation, the workshop was limited to the first 50 applicants. We did not opt for a smaller number, which would have necessitated a higher registration fee per participant. As we were not confident about getting 50 registrants from the field of mental health, we decided to invite researchers from all health disciplines.

Though it was effortless to reach the potential participants from Psychiatry and other mental health fields through various online groups of which we are members, reaching people in other fields was not easy. We created a website and a Facebook page for the workshop and linked the two. Then, a Facebook ad was created, targeting those who live in Kerala and come under any of the following three Facebook ads audience categories:

1. Demographics > Education > Fields of Study > Medical research
2. Interests > Additional Interests > Medical research
3. Demographics > Work > Job Titles > Research fellow

These criteria gave our ad a potential audience size of 60,000. However, scrutiny of the ad results revealed that it was reaching lots of irrelevant people. Hence, we discontinued the ad after spending Rs 1405/. (In the end, only one participant of the workshop came through the Facebook ads. We declined requests from researchers in unrelated fields such as law.)

We had access to two collections of relevant email addresses — when the first author had attended two workshops (one on journal editing and one on biostatistics) in the past, the organizers of those two workshops had sent group emails to all the participants, revealing all the email addresses to all the recipients. We collected those addresses and emailed our workshop's brochure to all of them, with a request to forward the same to their appropriate contacts. It is not clear how many participants were obtained through this method.

Participant characteristics

Eventually, 48 participants from 15 disciplines attended the workshop (Figure 1). Half of them were females, and half were from Psychiatry. The majority were faculty members (n=17), followed by those in clinical practice (n=14, Figure 2). Eight participants were from Tamil Nadu, and the remaining 40 were from Kerala.

A survey done at the commencement of the workshop revealed that 56% of the participants had not attended any day-long workshop on research before, 55% did not have any prior publication experience, and 52% were currently working on a manuscript and intended to submit it for publication in the coming two months.

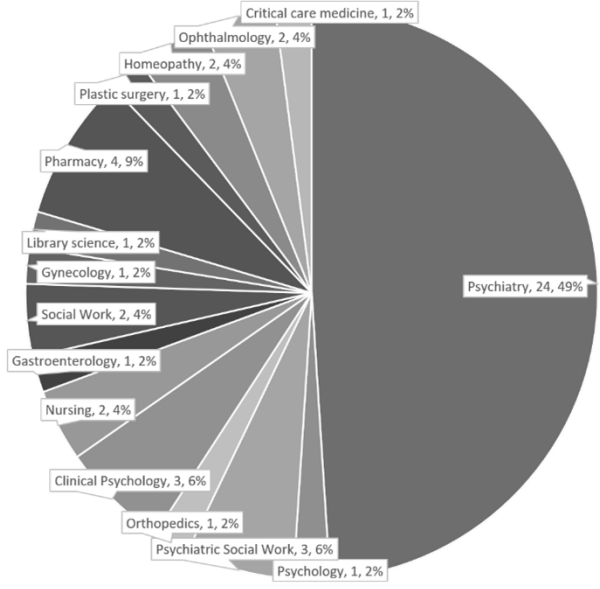

Figure 1: Disciplines of the 48 participants, with n and %

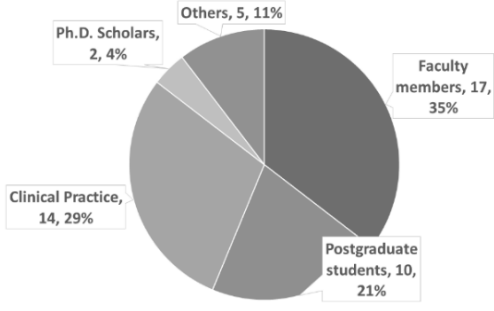

Figure 2: Current positions of the 48 participants, with n and %

Workshop description

The content included the basic structure and components of manuscripts and how to write each

section. Language aspects, the editorial and peer review process, and the ethical aspects of publishing were discussed from the author, peer reviewer, and editor perspectives. The modules were organized into less-than-an-hour sessions (Table1). Several within-session questions were embedded in our slides, using the AhaSlides, (https://ahaslides.com/), a website that helps conduct interactive presentations. The participants accessed the website using their smartphones and answered the questions anonymously, in real-time. To facilitate this, a wi-fi facility was provided in the venue. Handouts that included summaries of the modules were distributed, too.

Table 1: Content of the workshop

Topic	Duration
Day 1	
1. Introduction	45 mins
2. How to Share your Methods	45 mins
3. How to Present your Results	45 mins
4. Creating Effective Tables and figures	45 mins
5. How to Write the Discussion	45 mins
6. Title, Abstract, Keywords	45 mins
Day 2	
7. How to Search the Internet for Medical Literature	50 mins
8. How to avoid Common Language Errors	50 mins
9. References, acknowledgement, conflict of interest, data sharing statement	30 mins
10. How to Convert your Thesis to Research Paper	30 mins
11. How to Face the Peer Review Process	30 mins
12. What do editors expect	20 mins
13. How to Select a Journal for Submission	25 mins
14. How to Write a Case report	30 mins
15. Ethical aspects of Scientific Publishing	30 mins

Customizing the content

Though half of the participants were from Psychiatry, the remaining were from diverse medical specialities and even fields like pharmacy and homoeopathy and non-medical fields such as sociology, psychology, and library science. Hence, examples to illustrate various points were chosen with sufficient care. Though examples from psychiatry were the most used, jargons of the speciality were avoided, and only well-known terms such as "depression" and "schizophrenia" were used. Likewise, even the other medical conditions chosen for the purpose of examples were diabetes, hypertension, head injury, snake bite, and the like.

Group session

There was a breakout session. We divided the participants into nine groups before the commencement of the workshop. Care was taken to include persons of different disciplines and experience levels in each group. Stickers of nine different colours representing the group to which they are allotted were pasted on the files distributed to each participant.

Figure 3: How the participants were divided into nine groups and the sections allotted to them for critical analysis

Two research papers were selected so that one group can critically evaluate, from a scientific writing perspective, the introduction, methods, results, or discussion section of one of the articles: the remaining one group, the titles and abstracts of both the articles (Figure 3). The topics of the two articles were carefully chosen to ensure legibility to participants from diverse disciplines. One was on the quality of life in patients with diabetes mellitus, and the second, on what medical students think about the relevance of courses on epidemiology and biostatistics. Both the articles were emailed to the participants a few days before the workshop, with a request to all of them to go through both the articles.

The workshop was so scheduled that all sections of the IMRaD format were covered on day one. The group Session was held on day two. At the close of day one, the participants were suggested to check their respective files to find out to which group they belonged. The task for each group, too, was revealed then only. These two steps were intended to ensure that all of them paid sufficient attention to all the sessions and not just the one on the section their group will be handling. On day two, after the discussions among members of each group, one group member presented their findings to the whole team.

Workshop evaluation

We administered ten questions before the workshop (pre-test) and ten questions after the workshop (post-test) using AhaSlides. The questions were different for pre-test and post-test but were of similar difficulty levels. The correct responses ranged from 15.4 to 74.4% for the pre-test questions, whereas, for post-test questions, it ranged from 32.1 to 82.1% (Table 2). Overall, the proportion of correct responses were higher during the post-test as compared to the pre-test questions. Immediate real-time feedback was given to the participants as summary graphs, which were followed by discussions.

At the end of the workshop, the perception of the participants was obtained. Almost all rated the workshop as useful and were satisfied with the modules. We also received positive comments on the Facebook page of the workshop (Table 3).

Strengths and weaknesses of the workshop

The workshop was prepared in a structured manner, and at the same time, had the flexibility to accommodate changes during each session. The timings were adhered to, though not rigidly, so that discussions could happen. Several interactive elements, including the AhaSlides, were used to provide real-time feedback. Collecting responses through the website resulted in the active participation of all, including shy members. A mix of senior and junior participants resulted in better discussions. Senior members with prior publication experiences shared useful examples to illustrate various points. The workshop was organized during the weekend, starting on a Saturday afternoon. Thus, it was timed well to facilitate participants from different states to travel without much disruption of their work schedule.

The downside was a large group of participants, thus limiting the effective engagements of all during the discussions. This was minimized to some extent by the

Table 2: Proportion of correct answers during pre-test and post-test

Questions	Pre-test			Post-test		
	N	n (%)	95% CI†	N	n (%)	95% CI†
1	40	21 (52.5)	37.5 – 67.1	20	16 (80)	58.4 – 91.9
2	40	20 (50)	35.2 – 64.8	40	29 (72.5)	57.2 – 83.9
3	40	15 (37.5)	24.2 – 52.9	39	30 (76.9)	61.6 – 87.3
4	41	21 (51.2)	36.4 – 65.7	39	19 (48.7)	33.9 – 63.8
5	37	18 (48.6)	33.4 – 64.1	51‡	29 (56.8)	43.3 – 69.5
6	39	29 (74.4)	58.9 – 85.4	38	24 (63.2)	47.3 – 76.6
7	40	7 (17.5)	8.7 – 31.9	34	13 (38.2)	23.9 – 54.9
8	39	24 (61.5)	45.8 – 75.1	38	19 (50)	34.8 – 65.1
9	39	6 (15.4)	7.2 – 29.7	37	13 (35.1)	21.8 – 51.2
10	39	14 (35.9)	22.7 – 51.6	39	32 (82.1)	67.3 – 91.0

Note: Pre-test and post-test questions were not same, but of similar difficulty level; †Wilson score interval; ‡ Multiple responses were allowed for this question

Table 3: Comments about the workshop on our Facebook page

1	"I have been waiting for a workshop like this, as I was truly clueless about how to convert my thesis into papers for publishing. The workshop was very well organized, and every single moment was enriching enough to satisfy the needs of the participants. The idea to use Ahaslides for conducting tests and asking questions was wonderful. That kept everyone alert and lively throughout the sessions."
2	"One can easily learn research methodology and statistics from books, but to learn how to write efficiently and effectively is tough. With the tips and expert advice from Dr Shahul and Dr Samir, we now feel that writing research papers can be done by students even. Not just that, they made the experience so much more fun with all the quizzes and jokes that I'd recommend the classes any day!"
3	"Attended the workshop by two enthusiastic academicians ... maestros in the field.... would recommend for anyone keen on research writing."

discussions. This was minimized to some extent by the use of AhaSlides, an audience response system (ARS). Time constraints also limited stretching the discussions beyond a certain point. Despite our best effort, the participants being from diverse backgrounds, the examples from the medical field might have limited the understanding for some. Many participants, in their feedback, highlighted the lack of hands-on sessions in which they actually prepare various sections of a manuscript in real-time.

Suggestions for future workshops

The participants for these kinds of workshops could be from diverse backgrounds that facilitate generating more ideas and discussion. To understand the training requirements, a needs assessment survey could be carried out. The workshop content and the level could be modified accordingly to meet the expectation of the participants. A good workshop is possible with meticulous planning. Small details need to be worked out beforehand to avoid last-minute issues.

DISCUSSION

The workshop was successful, as judged by the active participation during the two days. Also, the feedback we received was positive. Several workshops and other programs have found positive perceptions of the participants and improved writing skills.[2-8] However, the evidence for the effectiveness of training programs for publication writing is limited, as reviewed by Galipeau et al.[9] discussions. This was minimized to some extent by the use of AhaSlides, an audience response system (ARS).

Our workshop included several essential components of scientific writing, as mentioned in Barroga and Vardaman.[10] Basic components of the manuscript and how to write each section, with examples, were included. Also, basic grammar usage and scientific style, with examples from published literature, helped the participants. Various perspectives taken by the presenters (of the author, peer reviewer, and editor) clarified the publication process.

The use of an ARS enhances interactive learning.[11] Our participants responded to the questions on their smartphones, using AhaSlides, which helped real-time assessment and feedback. Such online technologies have been found to improve the learning experience, and the perceptions are generally positive.[12] Our participants also reported positive experiences with this activity (e.g., "The idea to use AhaSlides to conduct tests and ask questions was wonderful").

Assessment during the teaching activities enhances learning. In fact, assessment for learning, or formative assessment, has gained more prominence than assessing learning or summative assessments.[13] Feedback based on direct observation of learner performance and originating from a trusted source is considered credible and enhances learning.[13] Incorporating assessment and feedback in the workshop setting was helpful in this regard.

Limitations included single educational intervention and subjective evaluation that precludes generalization. Also, the sample was small. As this program was organized by the authors, subjective bias is a possibility.

Nevertheless, the use of reflections to understand the strengths and weaknesses of the program will help improve it further.

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REFERENCES

1. Menon V, Varadharajan N, Praharaj SK, Ameen S. Why do manuscripts get rejected? A content analysis of rejection reports from Indian Journal of Psychological Medicine. Indian J Psychol Med (in press). doi: 10.1177/0253717620965845
2. Sommers PS, Muller JH, Bailiff PJ, Stephens GG. Writing for publication: A workshop to prepare faculty as medical writers. Fam Med 1996;28:650-4.
3. Edwards R, White M, Gray J, Fischbacher C. Use of a journal club and letter-writing exercise to teach critical appraisal to medical undergraduates. Med Educ 2001;35:691-4.
4. Sridhar AR, Willett LL, Castiglioni A, Heudebert G, Landry M, Centor RM, et al. Scholarship opportunities for trainees and clinician educators: learning outcomes from a case report writing workshop. J Gen Intern Med 2009;24:398–401.
5. Jawaid M, Masood Z, Alam SN, Jawaid SA. An analysis of interactive hands-on workshops on medical writing. J Pak Med Assoc 2011;61:66-70.
6. Guydish J, Masson C, Flentje A, Shopshire M, Sorensen JL. Scientific writing seminar for early-stage investigators in substance abuse research. Subst Abus 2016;37:238-41.
7. Fernández E, García AM, Serés E, Bosch F. Students' satisfaction and perceived impact on knowledge, attitudes and skills after a 2-day course in scientific writing: a prospective longitudinal study in Spain. BMJ Open 2018;8:e018657.
8. Wajekar AS, Salgaonkar SV, Chincholi IH, Shetty AN. Impact of basic medical writing workshop on case report writing by postgraduate anaesthesia trainees: A pilot study. Indian J Anaesth 2018;62:502-8.
9. Galipeau J, Moher D, Campbell C, Hendry P, Cameron DW, Palepu A, et al. A systematic review highlights a knowledge gap regarding the effectiveness of health-related training programs in journalology. J Clin Epidemiol 2015;68:257-65.
10. Barroga E, Vardaman M. Essential components of educational programs on biomedical writing, editing, and publishing. J Korean Med Sci 2015;30:1381-7.
11. Richardson ML, Shaffer K, Amini B, Spittler NLJ. Advanced, interactive, image-based education: technology and pedagogy. Curr Probl Diagn Radiol 2020;49:74-81.
12. Mącznik AK, Ribeiro DC, Baxter GD. Online technology use in physiotherapy teaching and learning: a systematic review of effectiveness and users' perceptions. BMC Med Educ 2015;15:160.
13. Watling CJ, Ginsburg S. Assessment, feedback and the alchemy of learning. Med Educ 2019;53:76-85.

Research Report

PREVALENCE OF DELIRIUM AMONG OLDER ADULTS IN A TERTIARY CARE REFERRAL HOSPITAL IN KERALA

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ABSTRACT

Background: Delirium is a common neuropsychiatric condition in older adults in medical and surgical settings. It is important to identify cognitive impairment in the elderly population early in their stay at the hospital to reduce morbidity and mortality. The literature on the prevalence of delirium in the elderly population shows that the occurrence of delirium is associated with patient factors and clinical settings. Delirium may affect the outcome of the primary medical condition in addition to the occurrence of poor compliance to treatment and long-term psychological sequela. **Aim:** The study aims to identify the prevalence of clinical delirium among patients at the age of 60 years or above admitted to medical and surgical units of Government Medical College Hospital, Kozhikode, Kerala. The study also looked into the related factors and management aspects of the condition. **Methods:** A cross-sectional observational method was used in a sample of 300 older adult patients who were selected using a census approach from medical and surgical inpatient units of the hospital. Clinical and personal details were collected in addition to the assessment of the participants with the Confusion Assessment Method (CAM) and Nursing Delirium Screening Scale(Nu-DESC). **Results:** Findings of the study revealed the prevalence of delirium in older adult patients at 16%. The study also shows a significant association between the prevalence of delirium and selected clinical variables and area of admission. **Conclusion:** Early identification, prompt medical and psychiatric care, and environmental manipulation will reduce complications in older adults.

Keywords: delirium, prevalence, older adults

INTRODUCTION

Delirium is an acute and fluctuating disorder of attention and cognitive functioning, accompanied by abnormal arousal and perceptual disturbances.[1] Delirium is a common clinical syndrome, especially among older adults, characterised by inattention and acute cognitive dysfunction.[2,3] This condition is frequently not recognised in elderly patients admitted to the hospital.[4] A high prevalence of delirium in the elderly population in hospitalised settings has been reported in literature.[5] Development of delirium leads to functional impairment, increased risk of morbidity and mortality.[6] Misdiagnosis of delirium or delay in recognising the delirium state in hospitalised elderly patients is very common.[6] Among the known risk factors of delirium, advanced age and baseline cognitive impairment are relatively significant. The development of delirium in older adult patients is highly correlated with rates of mortality.[7] This study aims to identify the prevalence of delirium in older adult patients admitted to Government Medical College Hospital, Kozhikode. The study also investigates the prevalence of delirium and its association with personal and clinical variables.

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A definitive diagnosis of delirium is based on DSM-5 criteria or ICD-10 criteria by a psychiatrist, which may not be often possible in a general medical or surgical setting. Various screening tools are available for the early identification of delirium. Confusion Assessment Method (CAM)[8] is frequently used in clinical settings to screen elderly patients for delirium, and Nu-DESC is used by nurses to screen and measure the severity.[9]

MATERIALS AND METHODS

Population and sample

The study population included older adult patients admitted to a tertiary care hospital. The sample constituted 300 patients at the age of 60 years or above admitted in selected wards and intensive care units. The study was conducted at Government Medical College Hospital, Kozhikode, which has a bed strength of 3000 and serves 40% of the population of Kerala. The sample size was 300, which was calculated based on a study conducted to identify the possible risk factors associated with delirium in the elderly, which reported a prevalence of 27% at some point during their hospital stay.[10]

Inclusion criteria

Admitted patients at the age of 60 years or above in selected medical, surgical wards and intensive care units, when either patient or caregiver is willing to participate in the study were included. Critically ill patients whose mental status could not be assessed, such as patients on ventilator, patient with tracheostomy tube, unconscious patients and clinically certified as deaf and dumb or having aphasia, were excluded. Patients under the palliative care unit were not included in this study.

Tools and technique

Based on the objectives of the study, a semi-structured interview schedule was prepared for collecting socio-personal variables and the clinical profile of the patients. Socio-personal variables included age, sex, religion, education status, socioeconomic status, type of family and marital status. Clinical information included the area of admission, diagnosis, length of hospitalisation, associated problems, and attention to delirium status by health care professionals. Content validity of the tool was established by experts in the field of psychiatry, medicine and nursing. Observation and general medical examination by the first investigator was the primary source of information. Review of the patient's clinical records, self-report by the patient or interview with the caregiver and nursing staff were the additional sources. Confusion Assessment Method (CAM) and the Nursing Delirium Screening Scale (Nu-DESC) were the specific tools used to identify delirium status.

The Confusion Assessment Method (CAM) is a standardised, evidence-based tool that enables non-psychiatrically trained clinicians to identify and recognise delirium quickly and accurately in a clinical setting. The CAM includes four features found to have the greatest ability to distinguish delirium from other types of cognitive impairment. The diagnosis of delirium by CAM requires both features A (acute onset or fluctuating course) and B(inattention) and the presence of either feature C (disorganised thinking) or D (altered level of consciousness).[11] The tool is in the public domain for academic purpose.

The Nu-DESC evaluates delirium based on observation of the following five features: disorientation, inappropriate behaviour, inappropriate communication, illusions/ hallucinations, and psychomotor retardation. The scale is rated for severity on a scale of 0-2, with a score range of Nu-DESC score 0-10, and a cut-off score of 2 for screening positive for delirium. Scores on Nu-DESC is also used in this study for assessing the severity of delirium. Psychometric properties of the Nu-DESC scale has been reported earlier for sensitivity and specificity.[9] Permission was obtained from the author for using the tool in this study. Inter-rater reliability was established for both the screening tools, where the CAM scale had a perfect agreement, and Nu-DESC was estimated to be 0.91.

A pilot study was conducted to check the feasibility of the study in a sample of 30. Ethical approval was obtained from the Institutional Ethics Committee. Administrative permission was obtained from the hospital authority, and informed consent was taken from individual participants or their caregivers.

Patients aged 60 years or above admitted in wards of medical and surgical departments or intensive care units were recruited for the study. Data were collected from one unit per day on a cross-sectional basis, with an average of 15-20 participants daily. The study was conducted during the month of January and February

2019. Data were collected in the afternoon and evening time of the hospital duty shift to account for the evening worsening of symptoms in delirium (sun-downing effect).[3] Clinical records were reviewed to confirm the responses under the clinical data. After collecting the clinical data, participants were screened with the Confusion Assessment Method (CAM). Participants who were positive for CAM were assessed for the severity of delirium using the Nu-DESC scale. Average, 5-10 minutes were taken for screening, and it took up to 20 minutes for each participant when it was positive for delirium to complete the data. Collected data were subjected to descriptive and inferential statistics using the 16th version of SPSS for Windows.

RESULTS

Sample characteristics of the study show that 60% of the participants were in the age group of 60-69 years, the majority (77.3%) were males, 67% were educated up to primary level, 82% were from Below Poverty Line (BPL) socioeconomic status, 93% were from a nuclear family, and 80.6% were married (Table 1). The clinical profile shows that 25.3% of the participants were diagnosed with coronary artery disease, and 24% were diagnosed with diabetes mellitus. (Table 2)

The distribution of participants based on CAM Score shows the prevalence of delirium as 16% (n=48), irrespective of the diagnoses. Similarly, the analysis of Nu-DESC scores is positive for 16% (n=48) of the participants. All the positive participants on CAM were positive on Nu-DESC as well. Screen positive patients in CAM were assessed using Nu-DESC for severity. The severity of delirium on the Nu-DESC scale showed a mean score of 4.23 (± 1.74).

A significant association was found between delirium and medical diagnoses such as cerebrovascular accident (28.2%), chronic kidney disease (47.3%), urinary tract infection (45%), chronic obstructive pulmonary disease (35%), pulmonary oedema (33.3%), hypertension (32.3%) and diabetes mellitus (26.3%). A substantial proportion of patients with acute kidney injury (24%), anaemia (23.5%), chronic Liver Disease (16.6%), general surgical procedures (11.7), cancer (7.54), head injury (36.3%), coronary artery disease ((17.1%) and metabolic encephalopathy (33.3%) had delirium, but there were no significant statistical association for these variables. (Table 3)

Associated problems such as electrolyte imbalance (46.5%), sleep deprivation (35.9%), visual impairment (35.9%), and constipation (45.4%) had a significant association with delirium. Pain (15.4%), alcohol use (18.7%), and hearing impairment (22.2%) were also present in a considerable number of patients who were positive for delirium, but no significant association were found. (Table 4). A significant proportion of patients from ICUs (24.1%) and medical wards (19.2%) had positive delirium status (p= .004). (Table 5) Association of the prevalence of delirium with socio-personal variables such as age, sex, educational level,

Table 1: Sample Characteristics (N=300)

Characteristics	Category	f	%
Age	60 to 64	99	33
	65 to 69	81	27
	70 to 74	58	19.3
	75 to 79	27	9
	80 to 84	18	6
	> 85	17	5.7
Sex	Male	232	77.3
	Female	68	22.7
Education status	No formal education	55	18.3
	Primary	201	67.0
	Secondary	40	13.3
	Higher secondary	2	0.7
	Graduate or Postgraduate	2	0.7
Socio economic status	BPL	246	82.0
	APL	54	18.0
Type of family	Nuclear Family	279	93.0
	Joint Family	18	6.0
	Institutionalized	3	1.0
Marital status	Married	242	80.6
	Widow or Widower	56	18.7
	Unmarried	2	0.7

Table 2 - Distribution of participants based on diagnosis (N=300)

Diagnosis	Frequency	%
Coronary artery disease	76	25.3
Diabetes mellitus	72	24
Hypertension	71	23.7
Anaemia	68	22.7
Cancer	53	17.7
Surgical procedures	51	17
CVA*	46	15.3
COPD*	20	6.7
Urinary tract infection	20	6.7
Chronic kidney disease	19	6.3
Pulmonary oedema	18	6
Head injury	11	3.7
Metabolic encephalopathy	9	3
Acute kidney injury	8	2.7
Chronic liver disease	6	2
Septicemia	3	1
Psychiatric disorders	2	0.7

socioeconomic status, type of family, marital status, and length of hospitalisation were statistically not significant.

Additional information gathered from patient records and interviews with nurses shows that in only 31.25% (n=15) of cases, the nursing staff had awareness about delirium in their patients. In 12.5% (n=6) of the cases, specific medications were prescribed. Specific measures or environmental measures were taken to manage delirium in 12.5% of patients (n=6). Psychiatric consultation for delirium management was done in 10.41% (n=5) of patients.

DISCUSSION

Analysis of socio-personal data shows that the majority (77.3%) of the participants were males. Studies on sex differences in hospital admissions show age and disease-specific reasons for variations in hospital admissions for males and females.[12] This study did not look into the reasons for the higher proportion of male participants admitted. Similarly, on socioeconomic status, most of the study participants (82%) belonged to the Below Poverty Line (BPL, an economic index stated by the Government of Kerala). It may be seen that elderly patients from BPL generally access government health services in this part of the country.

The primary objective of this study was to estimate the prevalence of delirium in older adult patients. We found that 16% of participants had delirium irrespective of the admission area and diagnosis. This finding is consistent with the results of other studies on the prevalence of delirium in hospitalised patients, which reported prevalence between 14 and 24%.[12] Present study was conducted among older adult patients in a tertiary care referral hospital, and patients undergoing palliative care were excluded.

Prevalence of delirium and medical diagnosis

Studies on the prevalence of delirium among older patients with stroke have reported estimates ranging from 13 to 48%.[14] In our study, in a sample of 46 patients with a cerebrovascular accident, a point prevalence of delirium in 28% was found. Similarly, previous studies have reported a high prevalence of cognitive impairment (up to 70%) among patients on dialysis and chronic kidney disease, consistent with our finding (47.3%).[15] Another study reported a high prevalence of delirium in the elderly inpatients and a direct association of delirium with UTI (36.8%) renal failure (40.9%).[16]

Similarly, the literature shows that the prevalence of cognitive impairment in COPD patients is approximately 56.7%, which is higher than our study's findings (35%).[17] Consistent with findings of this study, hypertension has been reported to be a significant risk factor for delirium by previous studies.[18]

The present study results show a significant association between the prevalence of delirium and diabetes mellitus. A previous study investigated the incidence, prevalence, risk factors and outcome of delirium in the elderly (≥60 years) patients admitted to a coronary care unit. Among the various risk factors studied, factors that were identified as predictors of delirium in the binary logistic regression analysis were

Table 3- Association between the prevalence of delirium and medical diagnosis (N=300)

Diagnosis*	Delirium status		χ^2 (df=1)	p-value
	Positive (%)	Negative (%)		
Cerebro vascular accident(n=46)	13(28.2)	33(71.8)	6.07	0.01*
Chronic kidney disease(n=19)	9(47.3)	10(52.7)	14.85	0.001**
Urinary tract infection (n=20)	9(45)	11(55)	13.40	0.001**
Chronic obstructive pulmonary disease (n=20)	7(35)	13(65)	5.75	0.01*
Pulmonary oedema(n=18)	6(33.3)	12(66.7)	4.28	0.03*
Hypertension (n=71)	23(32.3)	48(67.7)	18.60	0.001**
Diabetes mellitus(n=72)	19(26.3)	53(73.7)	7.60	0.006**
Anaemia (n=68)	16(23.6)	52(76.4)	3.70	0.05*
Head injury (n=11)	4(36.3)	7(63.7)	3.52	0.06
Metabolic encephalopathy (n=9)	3(33.3)	6 (66.7)	2.07	0.15
Acute kidney injury (n=8)	3 (24)	5 (76)	2.82	0.09
Coronary artery disease (n=76)	13(17.1)	63 (82.9)	0.09	0.76
General surgical procedures (n=51)	6 (11.7)	45 (88.3)	0.82	0.36
Cancer (n=53)	4 (7.54)	49 (92.46)	3.42	0.06

*There were multiple diagnoses in some patients

Table 4 - Distribution of participants based on associated problems and the prevalence of delirium (N=300)

Associated problems*	Delirium status		χ^2 (df=1)	p-value
	Positive (%)	Negative (%)		
Electrolyte imbalance (n=58)	27(46.5)	31(53.4)	49.93	0.001**
Sleep deprivation (n=64)	23(35.9)	41(64)	24.06	0.001**
Visual impairment (n=72)	20(27.8)	52(72.2)	9.77	0.002**
Constipation (n=44)	20(45.4)	24(54.6)	33.28	0.001**
Pain (n=97)	15 (15.4)	82 (84.6)	0.03	0.86
Substance use (n=16)	3 (18.7)	13 (91.3)	0.09	0.75
Hearing impairment (n=9)	2 (22.2)	7(77.8)	0.26	0.60

*There were multiple associated problems in some patients. ** Significant at 0.01 level

Table 5- Association between the prevalence of delirium and area of admission (N=48)

Area of admission	Delirium status		χ^2/ Fishers exact	p-value
	Positive (%)	Negative (%)		
Medical ward	23 (19.2)	97 (80.8)	19.21 (df=6)	0.004**
Surgical ward	7 (8.4)	76 (91.6)		
Oncology ward	2 (16.7)	10 (83.3)		
Nephrology ward	3 (60)	2 (40)		
Cardiology ward	0 (0)	16 (100)		
Neurology ward	0(0)	10 (100)		
ICU	13 (24.1)	41 (75.9)		

** Significant at 0.01 level

hypokalaemia (23%), presence of uncontrolled diabetes mellitus (23%) and presence of congestive cardiac failure.[19]

As per the present study, there is a significant association between the prevalence of delirium and anaemia. A similar finding was reported by a study conducted in a comparable critical care unit setting. It showed that patients with severe delirium had significantly lower haemoglobin concentrations than those with moderate or no delirium.[20]

Another study estimated the incidence of delirium and its risk factors among critically ill cancer patients in an intensive care unit. This study shows no association between the prevalence of delirium and the diagnosis of cancer. It reports that delirium is a frequent condition in critically ill cancer patients admitted to the ICU.[21] Community based cancer care and palliative care services has reduced the need for admission of such patients with this condition.

Similarly, this study has found that there is no association between the prevalence of delirium and head injury. In contrast, another study reported that almost half of patients with mild to moderate head injuries might develop delirium in the first four days after traumatic brain injury.[22]

Prevalence of delirium and associated problems

It is also found that the prevalence of delirium has a significant association with visual impairment. Comparable results have been reported earlier in a study among elderly patients with a history of hearing or visual impairment. They reported that uncorrected sensory impairment leads to increased delirium.[23]

Interestingly, we have found a significant association between the prevalence of delirium and sleep deprivation. Another study conducted among cardiac surgical patients indicates that sleep deprivation can either cause delirium, be a result of it, or may simply lower the clinical threshold for delirium. Decreased stage REM sleep has been hypothesised as contributing factors for the development of delirium. [24]

We have also found a significant association between the prevalence of delirium and physical problems like constipation. Evidence shows that chronic constipation, a frequent complaint among older adult patients, is often overlooked precipitating factor for delirium.[25]

Prevalence of delirium and area of admission

The present study revealed a relatively higher proportion of delirium positive status in the nephrology ward and ICU. A high proportion of delirium status in patients admitted in intensive care units, and its association with mortality has been studied elsewhere in a prospective cohort study. The findings showed that more than half of the participants (50.2%) developed at least one episode of delirium.[26] Our study excluded patients on ventilator and tracheostomy, as well as unconscious patients. The longitudinal nature of the development of delirium and

the prevalence of delirium in patients with end-stage illness may need further investigation.

Management of delirium

There are pharmacological interventions that provide rapid, effective, and safe relief to symptoms in delirium.[27] In this study, it was found that only 12.5% of delirium positive participants were receiving specific medications for delirium and specific environmental measures to reduce cognitive impairment. Among the delirium positive participants, psychiatry consultation was done in 10.41%. The low rate of detection and psychiatric management of delirium in patients admitted in general settings indicates the lack of awareness among health care professionals about these patients' psychological problems.[27] The specialty of Consultation-Liason Psychiatry in India needs to improve to provide the best and optimal care to the patients in general settings.[28] Careful observation of symptoms, signs, and behaviours are important in early recognition of delirium.[29] Our study also found that only in 31.25% of cases, nursing staff were aware of the delirium status of these participants. If identified early, pharmacological and nonpharmacological interventions involving patient and family education improve symptoms and relieve patient and family distress. Delirium frequently produces a significant amount of distress for patients, families, and caregivers.[30] The revised Clinical Practice Guidelines for Management of Delirium in Elderly published by the Indian Psychiatric Society outlines a practice framework for health care professionals in managing older adult patients with cognitive impairment.[3]

Limitations and recommendations

The study was a cross-sectional survey, limited to hospitalised older adult patients of a tertiary care referral hospital. Patients with end-stage diseases who are receiving palliative care were not included in this study.

Conclusion

The present study looked into the prevalence of delirium among older adult patients admitted to a tertiary care hospital. This study also looked into the association between the prevalence of delirium and selected variables in the elderly population. We recommend more focused longitudinal observation for the development of delirium in older adults admitted in hospitals, which benefit the patient with a better outcome.

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Conflicts of interest

The authors have no conflict of interest.

REFERENCES

1. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA: American Psychiatric Association; 2013.
2. Morandi A, et al. Understanding international differences in terminology for delirium and other types of acute brain dysfunction in critically ill patients. Intensive Care Med. 2008; 34: 1907–1915.
3. Grover S, Avasthi A. Clinical Practice Guidelines for Management of Delirium in Elderly. Indian J Psychiatry 2018; 60:329-40.
4. Inouye SK, Westendorp RGJ, Saczynski JS. Delirium in elderly people. The Lancet. 2014;383(9920):911–22
5. Alamri SH, Ashanqity OA, Alshomrani AB, Elmasri AH, Saeed MB, Yahya SA, et al. delirium and correlates of delirium among newly admitted elderly patients: a cross-sectional study in a Saudi general hospital. Ann Saudi Med. 2018; 38(1):15- 21.
6. Shaji KS, Jyothi KS. Clinical recognition of delirium. Indian J Psychiatry. 2014; 56:306.
7. Vasilevskis EE, Han JH, Hughes CG, Ely EW: Epidemiology and risk factors for delirium across hospital settings. Best Pract Res Clin Anaesthesiol. 2012; 26:277–87.
8. Kuhn E, Du X, McGrath K, Coveney S, O'Regan N, et al. Validation of a Consensus Method for Identifying Delirium from Hospital Records. PLoS One.2014; 9(11): e111823.
9. Gaudreau JD et al. "Fast, systematic, and continuous delirium assessment in hospitalised patients: the nursing delirium screening scale. J Pain Symptom Manage. 2005:29(4); 368-375.
10. Khurana PS, Sharma PSVN, Avasthi A. prevalence of delirium in geriatric hospitalised general medical population. Indian J Psychiatry. 2002; 44(1):41-46.
11. Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegal AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. Ann Intern Med 1990; 113(12):941-948.

12. Accorsi S, Fabiani M, Nattabi B, Ferrarese N, Corrado B, Iriso R, Ayella EO, Pido B, Yoti Z, Corti D, Ogwang M, Declich S. Differences in hospital admissions for males and females in northern Uganda in the period 1992-2004: a consideration of gender and sex differences in health care use. Trans R Soc Trop Med Hyg. 2007;101(9):929-38
13. Fong, Tamara G et al. "Delirium in elderly adults: diagnosis, prevention and treatment" Nature reviews. Neurology. 2009; 5:4 210-20.
14. McManus J, Pathansali R, Stewart R, Macdonald A, Jackson S. Delirium post-stroke. Age Ageing. 2007 Nov;36(6):613-8.
15. Murray AM. Cognitive impairment in the aging dialysis and chronic kidney disease populations: an occult burden. Adv Chronic Kidney Dis. 2008 Apr;15(2):123-32.
16. Pereira FB, Lopes MA. Delirium in elderly inpatients admitted to clinical wards prevalence and investigation of clinical conditions in a Brazilian sample. Dement Neuropsychol. 2018; 12(2): 152-156.
17. Bajaj MPK, Burrage DR, Tappouni A, Dodd JW, Jones PW, Baker EH. COPD patients hospitalised with exacerbations have greater cognitive impairment than patients hospitalised with decompensated heart failure. Clin Interv Aging. 2019;14:1-8)
18. Kim H, Chung S, Joo YH, Lee JS. The major risk factors for delirium in a clinical setting. Neuropsychiatr Dis Treat. 2016 Jul 21;12:1787-93
19. Grover S, Sarkar S, Yaddanapudi LN, Ghosh A, Desouza A, Basu D. Intensive Care Unit delirium: A wide gap between actual prevalence and psychiatric referral. J Anaesthesiol Clin Pharmacol. 2017; 33:480-6.
20. Granbergaxell C, Malmros W, Bergbom IL, Lundberg DBA. Intensive care unit syndrome/delirium is associated with anemia, drug therapy and duration of ventilation treatment. Acta Anaesthesiol Scand 2002; 46: 726–731.
21. Sánchez-Hurtado LA, Hernández-Sánchez N, Del Moral-Armengol M, et al. Incidence of Delirium in Critically Ill Cancer Patients. Pain Res Manag. 2018; 2018:4193275.
22. Maneewong J, Maneeton B, Maneeton N, et al. delirium after a traumatic brain injury: predictors and symptom patterns. Neuropsychiatr Dis Treat. 2017; 13:459-465.
23. LaHue SC, Liu VX. Loud and Clear: Sensory Impairment, Delirium, and Functional Recovery in Critical Illness. Am J Respir Crit Care Med. 2016; 194 (3): 252-3.
24. Watson PL, Ceriana P, Fanfulla F. Delirium: is sleep important? Best practice & research. J ClinAnesth. 2012; 26(3): 355-66.
25. Rosen T, Connors S, Clark S, Halpern A, Stern ME, DeWald J, Lachs MS, Flomenbaum N. Assessment and Management of Delirium in Older adult patients in the Emergency Department: Literature Review to Inform Development of a Novel Clinical Protocol. AdvEmergNurs J. 2015; 37(3), 183-96.
26. Klein Klouwenberg PMC, Zaal IJ, Spitoni C, et al. The attributable mortality of delirium in critically ill patients: Prospective cohort study. BMJ. 2014; 349:1–10.
27. Fleury MJ, Imboua A, Aubé D, Farand L, Lambert Y. General practitioners' management of mental disorders: a rewarding practice with considerable obstacles. BMC Fam Pract. 2012 16;13:19.
28. Grover S. State of Consultation-Liaison Psychiatry in India: Current status and vision for future. Indian J Psychiatry. 2011 Jul;53(3):202-13.
29. Irwin SA, Pirrello RD, Hirst JM, Buckholz GT, Ferris FD. Clarifying delirium management: practical, evidenced-based, expert recommendations for clinical practice. J Palliat Med. 2013;16(4):423-35.
30. Namba M, Morita T, Imura C, Kiyohara E, Ishikawa S, Hirai K. Terminal delirium: families' experience.Palliat Med. 2007 Oct; 21(7):587-94.

Research Report

A CROSS-SECTIONAL STUDY OF DEPRESSION AMONG DEATH ROW CONVICTS FROM A SOUTH INDIAN STATE

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ABSTRACT

Background: Convicts punished with death sentences are reported to show a higher vulnerability for depression than the general population and other convicts. Previous studies have looked at the prevalence of depression in convicts; however, no studies from India have examined depression specifically among death row convicts. The present study aims to assess the prevalence of depression among death row convicts. **Methods:** This is a cross-sectional study conducted among 28 death row convicts from a South Indian State, using a semi-structured questionnaire and Beck's Depression Inventory-II. After obtaining necessary permission from the government and prison authorities to interview the convicts, two visits were made to Central Prison, Belgaum. Descriptive statistics were used to measure the frequencies and percentages. **Results:** Most convicts in this study were aged between 30 and 60 years (68.96%) and predominantly male (93.10%). The majority of the convicts had mild or no depression, while the rest had moderate to severe depression (57.15% vs 42.85%). Depression was significantly higher during the initial phase of the conviction (57.13%). There was an inverse trend of depression (57.13%, ≤ 6 years vs 42.85%, > 6 years) with the duration of stay in prison. **Conclusions:** Depression is prevalent among death row convicts. More systematic observation and analyses are needed from both the legal and medical fraternity to look at the death sentence and its impact on mental health.

Keywords*:* convicts, depression, death row syndrome, prison, prison mental health

INTRODUCTION

Punishments have been used since time immemorial to change human behaviour. Medical research has consistently failed to prove that punishments bring long-term positive behavioural changes. A death sentence or capital punishment is punishment in one of its severest forms,[1] practised in many countries, including India, despite some countries having abolished the death sentence in the last few years.[2]

In many prisons, a convict with capital punishment is kept in solitary confinement or a segregated area.[1]

Solitary confinement is widely practised in western countries but is not commonly used in India due to Supreme Court directions.[3] The term "solitary confinement syndrome",[4] later known famously as the "death row syndrome," was coined to explain the reactive symptoms due to an award of the death sentence.[5,6] The symptoms include sensory disturbances, ideas of reference, aggression, memory disturbances, derealisation experiences, poor sleep, anhedonia, uncertainties about the future and poor social interactions. These symptoms were general in

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nature, and no standardised scales or guidelines are currently available to diagnose death row syndrome. There was also a high incidence of depression in convicts compared to the general population. Psychiatric morbidity is higher in the prison population than the general population[7] but has limited or no access to psychiatric services[8, 9] and has to access services elsewhere.

Previous studies have looked at the prevalence of depression in convicts.[10] There has been no study to date from India to the best of our knowledge, which has systematically examined depression among death row convicts. The long duration of stay in prison and the uncertainty about their death sentence makes evaluation of this population imperative. In Karnataka, India, death row convicts are housed in Belgaum Central prison and are not in solitary confinement. They are also allowed to meet their family members, counsellors, social workers and call them as specified. The convicts are not given any work in the prison as per the Supreme Court directions for death row convicts. They can interact and socialise with other prisoners and are given facilities for recreation. No form of demoralisation or any other psychological method of distress is used in Karnataka, India. The present study aimed to assess the prevalence of depression in death row convicts.

MATERIALS AND METHODS

Study participants

The study was conducted after acquiring the institutional ethics committee approval (DRP/EFP150/2017). After obtaining necessary permission from the government and prison authorities to visit the prison and interview the convicts, two visits were made to the Central Prison, Belgaum. All 29 prisoners, including two women, on death row sentence, were lodged in this prison. Interviews were conducted with 28 prisoners in the presence of the Prison Superintendent, a Prison Warder and the Prison Doctor. For one convict, permission was not given to interview, as hanging was said to be imminent.

Procedure

The interviews were conducted by VSH, a qualified psychiatrist (VSH), and a retired IPS officer (GVD) trained to conduct interviews by VSH. During the first visit, a semi-structured questionnaire was administered to capture the demographic details, duration of stay in prison, the reason for conviction, appeals and other information related to punishment and duration of stay.

The convicts were assured of the confidentiality of the information collected, and their informed consent was obtained for participating in the study. Beck's Depression Inventory-II (BDI), a 21-item multiple-choice questionnaire[11,15] (Validated in Kannada, the official regional language of Karnataka), was used to assess depression. The authors administered the scale (VSH and GVD), and in-depth interviews capturing the qualitative data to understand their perception of judgment, their future, and goals were recorded verbatim. Each interview lasted around 20-30 minutes over a period of 2 days. In the second visit, prison authorities and the prison doctor were interviewed for their input concerning their mental and physical health and perceptions. This was conducted for 30 mins each over a period of 2 days.

Statistical Analysis

Statistical Analysis was done using SPSS (IBM) Version 16.0. Descriptive statistics were used to describe the sociodemographic details and the proportion of prisoners having depression. Chi-square test was used to find the association between depression and time spent in prison. Certain details of the interview could not be analysed and documented in view of the sensitivity of the content and legal implications.

RESULTS

Most of the convicts in the study were belonging to age groups ranging between 30 and 60 years (68.96%) were predominantly male (93.10%), married (72.41%), illiterate (41.37%), and running their own business (34.48%) with an annual income < 1 lakh (55.17%).

Almost half of the convicts (48.27%) were in prison for > 5 years, and for about three-fourths of them (79.31%), appeals were pending at high court. BDI-II was administered to all the subjects. A majority of them had either mild depression or no depression, and the rest had moderate to severe depression, including suicidal tendencies in two individuals (57.15% vs 42.85%; Table 2).

Depression was significantly higher during the initial phase of the conviction. Even though it appeared that

Table 1. Sociodemographic data of the patients

Characteristics	n	Percentage
Gender		
Males	27	93.10
Females	2	6.89
Age (years)		
< 30	8	27.58
Between 30 and 40	11	37.93
Between 40 and 60	9	31.03
> 60	1	3.44
Marital Status		
Unmarried	8	27.58
Married	21	72.41
Education Status		
Not-Literate	12	41.37
Secondary Incomplete	7	24.13
Secondary Complete	05	17.24
≥ Higher Secondary	5	17.24
Income		
Less than Rs. 1 lakh	16	55.17
Between Rs. 1 – 3 lakhs	8	27.58
More than Rs. 3 lakhs	5	17.24
Occupation		
Service/Business	10	34.48
Skilled Worker	2	6.89
Unskilled worker	7	24.13
Agriculture	8	27.58
Others	2	6.89

the proportion of depression was higher; there was no significant association with the duration of time spent in the prison (Table 3). There was an inverse trend of depression [57.13% (n =16), six years or less vs 42.85% (n = 12), six years or more] with the duration of stay in prison.

Table 2. Duration in prison with their appeals pending at different levels and severity of depression.

Variable	n	%
Duration		
Less than 12 months	3	10.34
1 year to 5 years	12	41.37
5 years to 10 years	14	48.27
Appeals pending		
High Court	23	79.31
Supreme Court	4	13.79
Mercy petition before president	0	0
Mercy petition rejected	2	6.89
Beck's Depression Inventory-II scores		
Minimum or No depression (score 0-13)	8	28.57
Mild Depression (score 14 - 19)	8	28.57
Moderate Depression (score 20 – 28)	5	17.85
Severe Depression (score 29 – 63)	7	25

The qualitative aspects of the interview are beyond the scope of this article and hence not discussed. A detailed description is published elsewhere.[14]

DISCUSSION

The psychological reaction to stress is a unique and dynamic capacity, varying in different social, cultural and environmental setups. To date, most studies of death row convicts have been conducted in western countries, especially from the United States of America.[12] A recent report from Bengaluru, Karnataka, states that of 4,914 prisoners in the central prison of Bengaluru, 2,023 suffer from mental/behavioural disorders. Among them, 189 prisoners were identified with common mental disorders and 84 with severe mental disorders, and most disorders were found to occur due to abuse of several illicit drugs such as nicotine, alcohol, cannabis, opioids, and polysubstance.[13]

Table 3: Association between duration of prison stay and depression status.

Duration of Prison Stay	Depression Present (Mild, Moderate or Severe) n=20	Minimum or No Depression n=8	Total
Up to 6 years	11	5	16
More than 6 Years	9	3	12

Fischer's Exact Test; P>0.05 (Statistically not significant)

Symptoms of depression and other features of death row syndrome are primarily reported to be a reaction to hopelessness about the future. In the present study, most individuals did not report the symptoms mentioned in the literature specifically pertaining to death row syndrome. Even though many subjects scored high on BDI II, we could not correlate it with functionality, as they were not given any work. We had to rely on the verbal report of subjects and the monitoring authorities, which is one of the limitations of this study. The depressive symptoms were reported due to the uncertainty about the future, being away from the family and non-productivity.

Prolonged duration of stay in prison without any progress in appeals or execution has been indirectly installing hope in convicts. This can be hypothesised as a model opposite to "learned helplessness" for depression.

In a developing country like India, where much of the population is below the poverty line, most convicts belong to low socioeconomic status. The prison provides basic facilities, and some reported being more comfortable in prisons than in their homes as they must struggle to arrange for necessities outside the prison. This can also be seen as a mode of defence where convicts are content with avoidance of day-to-day expectations from the family and warrants further evaluation to look into the personality factors and coping mechanisms, which were not examined in this study.

Social insecurity and stigma after release from prison may also have contributed to not observing major depressive symptoms. This is in stark contradiction to findings reported by western countries, which have described features of death row syndrome in convicts. Notable, there are no specific scales or guidelines to measure death row syndrome.

There is no strict solitary confinement in India, compared to the western countries from where most of the literature has been reported so far. The socialisation and humanising element of the punishment may also be responsible for the findings in our population. These findings question the role of the death sentence and its implications on convicts and on state resources.[11] A sense of uncertainty was observed among the convicted individuals and the personnel in the system regarding the future of convicted individuals.

This brings up a pertinent yet complicated question regarding death row being an effective punishment. Our findings indicate that psychological implications on the convicts can be minimised by nonuse of solitary confinement, normalisation of behaviour, and responses to the convicts, facilitating a healthy mental status.

Our study has potential limitations. a) This is a cross-sectional study, and there were significant constraints due to the limited time permitted by the prison authorities for interviewing each convict. b) Detailed assessments for personality, experiential reports, and other factors related to death row syndrome could not be done. c) familial factors of background, support was not assessed, which may have provided information regarding the support system d) Legal and social support has not been assessed as these factors may have implications in the legal fight and appeals

CONCLUSIONS

Depression is prevalent among death row convicts. More systematic observation and analyses are required from both the legal and medical fraternity to examine the death sentence and its impact on mental health, especially regarding the death row syndrome. Prisons also require consistent mental health services to cater to the felt needs of this special population. Factors leading to depression should be addressed in future studies to reduce morbidity.

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REFERENCES

1. Grassian S, Friedman N. Effects of sensory deprivation in psychiatric seclusion and solitary confinement. Int J Law Psychiatry 1986; 8:49-65.
2. Schwartz HI. Death Row Syndrome and Demoralization Psychiatric Means to Social Policy Ends. J Am Acad Psychiatry 2005; 33:153–5.
3. Krishnaiyer V. Sunil Batra vs Delhi Administration. Available from: https://indiankanoon.org/doc/778810/ (Accessed on 20.02.2020)
4. Grassian S. Psychopathological effects of solitary confinement. Am J Psychiatry 1983; 140:1450-4.
5. Smith A. Not waiving but drowning: The anatomy of death row syndrome and volunteering for execution. B U Pub Int L J 2007; 17:237.
6. Wallace-Wells D. What Is Death Row Syndrome? Available from: https://slate.com/news-and-politics/2005/02/what-is-death-row-syndrome.html (Accessed on 20.02.2020)
7. Kumar SD, Kumar SA, Pattankar JV, Reddy SB, Dhar M. Health status of the prisoners in a central jail of south India. Indian J Psychol Med 2013; 35:373.
8. Mohandas E. Roadmap to Indian psychiatry. Indian J Psychiatry 2009; 51:173.
9. Thirunavukarasu M, Thirunavukarasu P. Training and national deficit of psychiatrists in India–A critical analysis. Indian J Psychiatry 2010; 52: S83-S8.
10. Bellad A, Naik V, Mallapur M. Morbidity pattern among prisoners of central jail, Hindalga, Belgaum, Karnataka. Indian J Community Med 2007; 32:307.
11. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961; 4:561-71.
12. Kren N. The Death Row Phenomenon: Examining the Concept from a Human Right Point of View: Vienna Master of Arts in Human Rights. Available from: https://www.uhrsn.org/wp-content/uploads/formidable/Torture-Paper-Nina.pdf (Accessed on 20.02.2020].
13. Bengaluru: 2,000 jail inmates suffer from mental disorders Bengaluru. Available from: https://timesofindia.indiatimes.com/city/bengaluru/bengaluru-two-thousand-jail-inmatessuffer-from-mental-disorders/articleshow/74373900.cms. (Accessed on 05.03.2020)
14. http://www.beechi.in/shop/kannada-novels/maranadandanegedaada-kukhyaatha-kaidigalu/ (Accessed on 25.02.2021)
15. https://pearsonclinical.in/solutions/beck-depression-inventory-ii-bdi-ii/ (Accessed on 25.03.2021)

Research Report

MENTAL HEALTH PROBLEMS AMONG MEDICAL STUDENTS DURING COVID-19 LOCKDOWN: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: COVID-19, which originated in China, became a pandemic affecting more than 180 countries. By April 2020, India had announced lockdown in an attempt to control the spread of the virus. Lack of social interaction and apprehension about the studies had created emotional disturbances among medical students. **Methods**: The study was done in a medical college situated in Central Travancore, Kerala, between 2020 April 20 to May 31. Depression Anxiety Stress Scale (DASS) and Impact Event Scale-Revised (IES-R) were administered in Google forms to the MBBS batch WhatsApp groups. **Results**: Out of 320 responses from medical students, 239 were females, and 82 were male students. 56% of male students and 54% of female students have mild to severe depressive symptoms, 58% of male students and 54% of female students have symptoms of anxiety, and 63% of male students and 50% of female students experienced mild to severe stress.68% of males and 62% of females have higher Impact events scale. **Conclusion**: There is a high prevalence of anxiety and depression among medical students during the COVID lockdown period. There is a significant difference between genders in scores of anxiety, stress and impact of events. This shows the need for resilience training among medical students.

Keywords: COVID-19, medical students, mental health

INTRODUCTION

COVID-19 pandemic originated in November 2019 from Wuhan of China has now become pandemic affecting more than 180 countries. The Indian population, mainly youth, is passing through a state of psychological trauma due to social isolation, online classes and uncertainty about the future. By April 2020, more than a million people have been infected globally, and the population around the world has become anxious about the spread of the disease around the continents. India had become the largest containment in history, with 1.3 billion populations under lockdown in an attempt to flatten the number of infected cases.[1] The lockdown and the spread of fake news in social media created fear and apprehension among the students. The medical students among various medical colleges in India had to discontinue their courses and postpone their exams. Lack of social interaction due to online classes created a feeling of loneliness.

The viral epidemic and the associated social isolation have badly affected the youth mental health, and there is an emergent need for psychosocial intervention. The study by Leili Liang showed the impact of viral pandemics like SARS in 2003 and H1N1 in 2009 on the public's mental health. Post-traumatic stress disorders

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and depressive disorders were the commonest emotional problems among the affected population. There is a tendency to adopt faulty coping methods, especially among youth.[2] The government and health department are striving to improve public awareness of prevention and intervention strategies by providing websites and links. But there is false or misguiding information through social media may lead to information overload, which can cause mental health problems.[3]

Social isolation worries about the examinations and the stress in attending online classes had created a dilemma among the medical students of Kerala. The Kerala University of Health Sciences had postponed all the examinations, and students were prohibited from entering the hospital premises. Moreover, online classes have changed the concept of learning, and they were bound to attend theoretical discussions than practical classes. There are few studies from Kerala about the emotional problems of medical students during the COVID-19 lockdown.

MATERIAL AND METHODS

The study was done in a medical college situated in central Travancore, Kerala, between April 20, 2020, to May 31, 2020. This was a cross-sectional online study done through Google forms. Since it was the period of lockdown due to COVID-19, the students were bound to their homes, and the classes were through online media. The Depression Anxiety Stress Scale (DASS) and Impact Event Scale-Revised (IES-R) were administered in Google forms to the MBBS batch WhatsApp groups. DASS is a 21-item self-report questionnaire that assesses recent experiences of stress (e.g., "I found it hard to wind down"), anxiety (e.g., "I felt close to panic"), and depression (e.g., "I felt that I had nothing to look forward to"). Each 7-item subscale is rated on a 4-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much). Higher scores represent greater symptomatology.[4]

Impact event scale (IES), a 22-item questionnaire composed of three subscales, aims to measure avoidance, intrusion, and hyperarousal. The total IES-R score was divided into 0-23 (normal), 24-32 (mild psychological impact), 33- 36(moderate psychological impact), and>37(severe psychological impact).[5] The questioners were posted in batch WhatsApp groups showing the purpose of the study and explaining how to fill the questionnaire. The consent was sought through Google forms before enrolling on the study. Around 400 students received the form, and 320 students responded. The questionnaire was sent to all medical students except the final year students.

Ethical approval

The Institutional Ethics Committee cleared the study. The cover page includes electronic informed consent with a declaration of confidentiality and anonymity of the participants.

RESULTS

Table.1 DASS Depression score among students

DASS Depression Score	Gender		Total
	Male Number (%)	Female Number (%)	
<4	36(43.9)	110(46)	146(45.4)
4-6	25(30.5)	95(39.7)	120(37.4)
7-10	14(17.1)	28(11.7)	42(13.1)
>11	7(8.5)	6(2.5)	13(4)
TOTAL	82	239	321

Chi -square– 8.27; Df= 3; p= 0.041

Out of 320 responses from medical students, 239 were females, and 82 were male students. Fifty-six per cent of male students and 54% of female students had mild to severe depressive symptoms. There was a significant difference between both genders as severity increases (Table.1). Fifty-eight per cent of male students and 54% of female students had symptoms of anxiety. There was no significant difference among male and female students (Table.2). Sixty- three per cent of male students and 50% of female students experienced mild to severe stress. There was a

Table.2 DASS Anxiety score among students

DASS Anxiety score	Gender		Total Number (%)
	Male Number (%)	Female Number (%)	
<6	35(42.7)	110(46.1)	145(45.2)
6-7	30(36.6)	95(40.2)	125(38.9)
>10	5(6.1)	9(3.8)	13(4)
Total	82	239	321

Chi–square- 1.99; Df= 3; P= 0.574

Table 3. DASS score for stress among students

DASS Score for stress	Gender		Total Number (%)
	Male Number (%)	Female Number (%)	
<7	30(36.6)	120(50.2)	150(46.7)
8 -9	32(39)	89(37.2)	121(37.7)
10-12	14(17)	21(8.8)	35(11.5)
>13	6(7.3)	9(3.8)	15(4.7)
Total	82	239	321

Chi-square–7.97; Df = 3; P= 0.047

Table 4. Impact Event Scale scores among students

DASS Score for stress	Gender		Total Number (%)
	Male Number (%)	Female Number (%)	
<24	35(42.9)	115(48.1)	150(46.7)
24 -32	26(31.7)	90(37.7)	116(36.1)
33 -36	13(15.9)	25(10.5)	38(11.8)
>37	8(9.8)	9(3.8)	17(5.3)
Total	82	239	321

Chi-square – 6.621; Df= 3; P= 0.085

significant difference between genders (Table.3). Sixty-eight per cent of males and 62% of females have a higher Impact events scale, and there is a significant difference between genders (Table.4).

DISCUSSION

The majority of the participants were more female students (239/321); this is the same as the male to female ratio of students at the college. In table.1, DASS Score for depression shows a statistically significant difference between the scores of male and female students, and mild depressive symptoms are more in female students. Moderate to severe depression is more in male students, which is consistent with the study done by Leili Liang etalon effect of COVID-19 on youth mental health, which showed males had a high score in GHQ-12 and negative coping style.[2] In this study, among 82 male students, 46 per cent had depressive symptoms, and among 239 female students, 44 per cent had depressive symptoms. This finding is similar to the study done by Leili Liang and et al., which showed that 40.4 per cent of participants had psychological problems.[2]

There is no significant difference between male and female students in DASS 21 anxiety scores, which is against the study in India by Nathiya et al., where the female population showed more anxiety during Covid lockdown.[1] This might be because the current study is on a homogenous group of the same social and educational background. The values of the DASS anxiety score revealed that 47 per cent of male students and 44 per cent of female students had anxiety symptoms. An Australian study on medical students' mental health during COVID 19 lockdown shows 68 per cent of students had psychological deterioration, which increased the risk of poor academic performance. In this study, there is no significant difference between male and female students.[6] A study in China (n = 8079) conducted among 12–18-year-old youth found that the prevalence of depressive and anxiety symptoms was 43.7% and 37.4%, respectively.[2]

Considering the level of stress in the DASS-21 subscale, male medical students showed significantly high stress scores than females. 63 % of male students and 49 % of female students showed high score on the DASS-21 stress scale. A North Indian study on youth mental health showed higher female preponderance with a higher educational level.[7] A study done by Junling Gao showed a robust association between emotional disturbance and social media exposure.[3]

On evaluating the scores on the impact event scale (IES-R), there is no significant difference between both sexes.52% of male students and 50% of female students showed mild, moderate, and severe symptoms. That shows that 51 % per cent of the participants is prone to develop Post Traumatic Stress Disorders. This is similar to the finding shown in a North Indian study on medical students.[7] A study done on medical students in Turkey showed 60% of participants had high scores in IES-R, and this study has high scores in female students, which is against our finding.[8]

CONCLUSION

As per going through the analysis, it was found that 40 to 50 per cent of medical students were affected with anxiety, depression, and stress. The impact of COVID19 is so severe that 51% of them showed higher scores in IES-R. Lockdown and its sudden implication in future studies and contagious

information load on social media, social distancing affecting interpersonal relationships and boredom of online classes might be the potential causes of psychological impact on medical students. There is a male predominance in severe depressive symptoms and stress; this may be taken care of by the authorities. The government, Kerala University of Health Sciences, and the management of concerned colleges should address the mental health of the medical students along with their academic activities.

Limitations

Homogenous group, small sample size and using the online platform are the limitations of the study.

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Conflict of interest
None declared.

REFERENCES

1. Deepak Nathiya D, Singh P, Suman S, Raj P, Tomar BS. Mental health problems and impact on youth minds during the COVID-19 outbreak: Cross-sectional (RED-COVID) survey. Social Health and Behavior. 2020 July 1;3(3):83.
2. Liang L, Ren H, Cao R, Hu Y, Qin Z, Li C, Mei S. The effect of COVID-19 on youth mental health. Psychiatric quarterly. 2020 Sep;91(3):841-52.
3. Gao J, Zheng P, Jia Y, Chen H, Mao Y, Chen S et al. Mental health problems and social media exposure during COVID-19 outbreak. PloS one. 2020 Apr 16;15(4):e0231924.
4. Horowitz M, Wilner N, Alvarez W. Impact of Event Scale: a measure of subjective stress. Psychosom Med. 1979 May;41(3):209-18.
5. Lovibond P: Overview of the DASS and Its Uses. Retrieved from: http://www2.psy.unsw.edu.au/dass/over.htm.
6. Lyons Z, Wilcox H, Leung L, Dearsley O. COVID-19 and the mental well-being of Australian medical students: impact, concerns and coping strategies used. Australasian Psychiatry. 2020 Dec;28(6):649-52
7. Kumar A, Kumar A, Sharma D, Sharma S, Bansal R, Shukla A et al. Ahmad S. Indian Journal of Public Health Research & Development. 2020 Oct;11(10):82-87
8. Torun F, Torun SD. The psychological impact of the COVID-19 pandemic on medical students in Turkey. Pakistan journal of medical sciences. 2020 Sep;36(6):1355.

Research Report

VISITS TO A MALAYALAM WEBSITE ON MENTAL HEALTH: ANALYSIS OF SEVEN YEARS' DATA

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ABSTRACT

Background: Online articles are an important opportunity for educating the public on mental health topics. No previous study has examined the performance of a mental health website with content in an Indian language. **Methods**: Data on user acquisition and behaviour were obtained through Google Analytics for the first seven years (February 2014 – February 2021) of a Malayalam website that features 93 articles on mental health. Major Google Analytics variables assessed were the numbers of new and returning visitors, bounce rate, number and duration of sessions, pageviews, and unique pageviews. Relevant variables were compared for the first and seventh years. **Results**: In the seven years, there were 82,137 sessions, of which 21.81% were from returning visitors, 64.03% were from India, and 35.54% were from the state of Kerala, India. The mean session duration was 2 minutes 18 seconds. User engagement dropped over the study period. While in the first year, 77.20% of the visitors accessed the website from desktops, in the seventh year, 72.03% used mobile phones. Though social media was the major source of visitors (36.26%), the proportion of visitors has declined. Over the study period, the specific social media sites that send the most traffic and the browsers the visitors predominantly use have changed. Most keywords that brought users from search engines were about love and sex. The most popular articles were also about love and sex. **Conclusion**: Periodic and long-term monitoring using Google Analytics can provide insights that owners of mental health websites can exploit to attract more visitors and improve user engagement. Older websites may need optimization to utilize the growing visits from mobile phones.

Keywords: Mental health website, usage analysis, Google Analytics

INTRODUCTION

Educating the public on mental health matters has a vital role in promoting behaviours that boost mental health, reducing stigma, early detection of mental illnesses, and encouraging simple and practical interventions in the community itself.[1] In the digital era, websites have become a major resource for the public looking for health information[2] because they can search, understand, and gauge information that fits their specific needs.[3] As for any health intervention, periodic assessment of performance and acceptability is important in health information websites. By analyzing the traffic and user behaviour on a health website, we

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can gain insights into whether the intended audiencesufficiently accesses the site and what type of content is more attractive to its users. Knowledge about the technical aspects – for example, what devices and browsers the visitors use – will help ensure that the site is adequately accessible to a broader population. Assessing the sources of website traffic, such as search engines and social media, will provide clues to where all our efforts and resources have to be invested to increase awareness about the site. Also, assessing the time trends in user behaviour and the technologies involved will help appropriately modify our promotion efforts and the site's content and technical aspects and consistently obtain the best results.

Many studies have assessed the performance of health information websites. Yadav et al. studied the performance of the India against the Cancer website of the Indian Council on Medical Research. They found that the number of visits increased by 282.9% between two consecutive years.[4] The study revealed many visitor preferences that provided the authors a direction to improve the website's content. Kirk et al. researched the usage data of a website intended to educate nurses about genetics. They uncovered many areas they have to focus on to improve the site's effectiveness, including increasing the conversion of new visitors to returning ones and increasing the time the visitors spend on the site.[5]

A few studies are available on mental health information websites, too. Song et al. assessed the usage patterns of a Canadian mental health portal and found that the visitors spend less than the average time on some of the most important self-help tools on the site.[6] They also noticed that the users to whom personal email invitation was sent spend more time on the site and viewed more pages. King et al. assessed the performance of a website on male suicide. They found 307 outbound clicks to websites of helping organizations and 802 downloads of psychoeducation material, leading the authors to conclude that its visitors engaged well with the website.[7]

However, searches in PubMed and Google Scholar with appropriate keywords did not reveal any study that evaluated the performance of any website on mental health in an Indian language. Hence, this study aimed to detect, in a website that publishes articles on mental health in Malayalam, a language spoken in the state of Kerala,

1. the number of visitors, their engagement with the site, the kind of devices and browsers they use, and how all these changed over seven years (2014-2021),
2. the geographical location of the visitors,
3. the sources that drive traffic to the website and how they changed over seven years,
4. the keywords that bring most search engine traffic, and
5. the most popular articles.

MATERIAL AND METHODS

The website

The author has been writing Malayalam articles on mental health for various Malayalam periodicals since 2011. In 2014, he started posting all his articles on a website (www.mind.in). The first article was published at the site on 9th February 2014, and nine articles written before that date were added in the next 16 days. Currently, the site has 93 articles. Most of the topics were assigned by the publications that requested the article, while the author himself chose some.

The website is promoted through its Facebook page named ''Manasikarogyam'' owned by the Kerala state branch of Indian Psychiatric Society, the author's Facebook account, the website's Flipboard account, by incorporating the website address in the author's affiliation included in the articles printed in various publications, by mentioning the website address in the author's visiting card given to his patients and their caregivers, and on a notice displayed in the waiting area of his outpatient clinic.

The site is built with the Joomla content management system and uses the EasyBlog extension for Joomla to prepare and publish the articles.

Google Analytics

Google Analytics (GA), a free tool, is widely used to track and report website traffic. Though it is mainly designed to garner insights from a marketing perspective, it has been widely used in health research to monitor the performance of health-related websites. Examples include studies of websites on genetics,[5] vaccine safety,[8] pediatric surgery,[9] and osteoporosis and fractures.[10] Indian researchers have used it to assess a website on maternal-child health[11] and the 'India Against Cancer' website mentioned earlier.[4] GA has also been used to evaluate websites on mental health

topics: examples include the Song et al.[6] and King et al.[7] studies mentioned earlier, a study by Jeong et al. on another Canadian mental health portal,[12] and a study on a sexual health website.[13]

Some of the terms used in GA reports and this paper are defined below:

- New visitor: GA records a visitor as 'new' the first time a website is accessed from a device that does not contain GA's cookie for the website.
- Returning visitor: Someone who revisits the site from the same device within two years of the first visit.
- Session: A group of user interactions at the website that take place within a given time frame. A session starts when a user visits a page on a site and ends after 30 minutes of inactivity or when the person leaves the site.
- Pageviews: The number of pages accessed by all users.
- Unique pageviews: This differs from the pageviews mentioned above in that if a user visits a page more than once, here it will be counted as one visit only.
- Bounce rate: Percentage of visitors who left the site after viewing only one page.
- Average page load time: The average time taken for a page to load, from initiation of the pageview (e.g., click on a page link) to completion of the load in the browser.

Data collection

BIGSHOT Google Analytics extension for Joomla was installed on the site. This extension inserts a tracking tag that collects various forms of data related to user behaviour as soon as someone starts using the website. The information thus collected can be viewed by the website administrator by logging in to the GA website. Data on specific variables for any given period can also be downloaded in various formats, including as an Excel file.

Performance indicators studied

For this analysis, information was extracted for the seven years from 9th February 2014 (the date on which the first article was posted on the site) till 8th February 2021, on the following key performance indicators:

- Number of new and returning visitors
- Number of sessions, pageviews per session, and mean session duration
- Countries and Indian states from which the visits originated
- Type of devices used for access (e.g., desktop, mobile)
- Traffic source (e.g., a direct visit by typing the website address in a browser, from a search engine)
- Keywords that brought visitors from search engines
- Pageviews and unique pageviews each article received, and the mean time spent on each article

Ethical aspects

GA provides information in the form of aggregated data, without any personally identifiable information about the site visitors. Hence there are no ethical concerns in using it for research.[5,14] As this study was based only on the data from GA and did not involve direct assessment of human participants, no ethics committee approval was sought.

Statistical analysis

This is a descriptive cross-sectional study, and the aggregate data obtained from GA is being provided. Categorical variables are summarized as numbers and percentage, while continuous variables are summarized as mean. (GA does not provide the standard deviation or individual data that we can use for an analysis.)

RESULTS

In the seven years studied, there were a total of 82,137 sessions, of which 64,219 (78.19%) were from new visitors, and the remaining were from returning visitors. The total number of pageviews in the period was 1,45,780. While the mean bounce rate, pageviews per session, and session duration for the period were 73.51%, 1.77, and 2 minutes 18 seconds, respectively, the values for the new visitors were 75.72%, 1.66, and 1 minute 55 seconds, respectively, and those for the returning visitors were 65.62%, 2.19, and 3 minutes 40 seconds, respectively. While 61,541 sessions lasted <10 seconds, 1,955 lasted 31-60 seconds, 4,544 lasted 61-180 seconds, 6,121 lasted 181-600 seconds, 5,218 lasted 601-1800 seconds, and only 1,101 lasted more than 30 minutes.

Table 1 reveals that most parameters of user engagement went down with the passage of years, the sole exception being a slight improvement in the number of pages viewed per session.

Table 1 – Changes in key indicators of user engagement, from the first to the seventh year

	First year	Seventh year	% Change
New visitors	19,342	3,551	-81.64%
Sessions	24,469	4,603	-81.19%
Page views	44,758	8,784	-80.37%
Pages/Session	1.83	1.91	4.33%
Mean session duration	00:02:41	00:01:42	-36.55%
Bounce rate	69.46%	71.02%	2.24%

In the entire study period, the number and percentage of new users who accessed the website with desktop, mobile, and tablet were 30,918 (48.14%), 31,915 (49.70%), and 1,386 (2.16%), respectively. While the corresponding values for the first year were 14,946 (77.20%), 4,027 (20.80%), and 388 (2.00%), respectively, those for the seventh year were 909 (25.58%), 2,560 (72.03%), and 85 (2.39%), respectively.

The six most commonly used browsers (with the number of users in brackets) in the first year were Chrome (11,676), Firefox (3,464), Internet Explorer (943), Opera Mini (943), Android Browser (918), and Safari (in-app) (489). In the seventh year, the picture changed to Chrome (2,196), Safari (370), Android Webview (313), Samsung Internet (193), and Safari (in-app) (121).

After excluding those countries, the visitors from which had a mean session duration of < 5 seconds, it was found that the site has been accessed from 96 countries. Most visitors accessed the site from India (Table 2). The 52,595 sessions from India constituted 64.03% of the total sessions on the site. Most other countries in the top ten list are from the middle east. Though some visitors were from Western countries, the bounce rate is higher, and the mean session duration is seconds.

After excluding those states and union territories from which the visitors had a mean session duration of < 5 seconds, it was found that the site has been viewed from 28 Indian states and union territories. The state with the most number of visitors was Kerala, and it was followed by the two neighbouring states of Tamil Nadu and Karnataka (Table 3). The 29,191 sessions from Kerala constituted 35.54% of the total sessions on the site. Kerala had the lowest bounce rate and the highest page views per session and mean session duration, too.

Regarding the sources of the visitors, for the entire period, social media sent the maximum number of visitors (36.26%), and direct visits came a close second (33.94%, Table 4). Compared to the first year, in the seventh year, while the proportion of direct visitors and visitors from search engines and other sites increased, the proportion from social media reduced considerably.

A closer look at the social media sources of traffic, for the entire period and the first and seventh years separately, reveals Facebook to be much ahead of all others (Table 5). YouTube, which was not in the top 6 in the first year, reached position 4 in the seventh year. On the other hand, Google+, which enjoyed the third position in the first year, has ceased to exist. In the entire seven-year period, visitors sent by Twitter spent the most time on the site and viewed more pages per session. In the seventh year, though visitors from Instagram came second in terms of the number of sessions and pageviews, the mean session duration is the lowest in the group for them, at a meagre of 27 seconds. The search engine keywords that brought > 25 visitors to the site are listed in Table 6 (n=11). The majority of them are related to love and sex. Those who reached the site using the broad keyword "മനശാസ്ത്രം" (psychology) had a much higher mean session duration.

The list of ten articles that attracted the most visitors says that articles on love, marriage, and sex are the most popular (Table 7). At the same time, articles on cognitive development, psychology of happiness, and personality improvement also made it to the list. A look at pageviews and unique pageviews reveals that some visitors reread the articles. While eight of the articles were published in 2014, one each was published in 2015 and 2016. For all except one of the articles in the list, the topic was the brainchild of the publication and not the author.

The average page load time, provided by GA after assessing 16,902 page loadings, was 12.59 seconds.

Table 2 – Top ten countries from which visitors accessed the website

	Country	New visitors	Sessions	Bounce rate	Pageviews / Session	Mean session duration
	India	38,830	52,595	69.89%	1.94	00:02:46
2	United States	6,253	6,929	84.12%	1.31	00:00:56
3	United Arab Emirates	3,846	4,756	76.20%	1.69	00:02:08
4	Saudi Arabia	2,429	3,036	74.87%	1.68	00:02:29
5	Qatar	1,114	1,406	74.54%	1.70	00:02:16
6	United Kingdom	1,086	1,191	83.46%	1.34	00:00:44
7	Oman	790	997	77.73%	1.82	00:02:09
8	Kuwait	672	892	76.46%	1.58	00:02:10
9	Germany	706	789	84.92%	1.25	00:00:36
10	Bahrain	653	784	79.72%	1.56	00:02:08

Table 3 – Top five Indian states from which visitors accessed the website

	State	New visitors	Sessions	Bounce Rate	Pageviews/ Session	Mean Session Duration
1	Kerala	21,313	29,191	67.21%	2.07	00:02:55
2	Karnataka	6,782	9,051	73.75%	1.75	00:02:34
3	Tamil Nadu	2,757	3,738	71.00%	1.86	00:02:47
4	Maharashtra	2,241	2,787	74.96%	1.67	00:02:05
5	Delhi	1,893	2,350	70.34%	1.84	00:02:26

Table 4 – Proportion of visitors from different traffic sources in the entire period, first year, and seventh year

	Entire period	First year	Seventh year	Change
Direct visit	21,796 (33.94%)	5,845 (30.19%)	1,966 (55.32%)	-66.36%
Search engines	12,516 (19.49%)	1,037 (5.36%)	768 (21.61%)	-25.94%
Social media*	23,286 (36.26%)	11,505 (59.42%)	456 (12.83%)	-96.04%
Links from other sites	6,597 (10.27%)	959 (4.95%)	364 (10.24%)	-62.04%
Others	24 (0.04%)	15 (0.07%)	0	-100.00%

* See Table 5 for detailed breakup and time trends

Table 5 – Top six social media sources in the entire period, first year, and seventh year.*

Rank	Site	No. of sessions (%)**	Pageviews (%)**	Mean session duration	Pages/Session
Entire study period					
1	Facebook	27,731 (94.62%)	46,540 (93.34%)	00:02:17	1.68
2	Twitter	727 (2.48%)	2,059 (4.13%)	00:04:57	2.83
3	Instagram	287 (0.98%)	394 (0.79%)	00:00:16	1.37
4	Google+	211 (0.72%)	419 (0.84%)	00:03:16	1.99
5	Blogger	110 (0.38%)	113 (0.23%)	00:00:03	1.03
6	VKontakte	84 (0.29%)	104 (0.21%)	00:00:52	1.24
First year					
1	Facebook	14,232 (97.53%)	24,684 (96.52%)	00:02:33	1.73
2	Twitter	248 (1.70%)	730 (2.85%)	00:05:03	2.94
3	Google+	102 (0.70%)	142 (0.56%)	00:00:58	1.39
4	LinkedIn	3 (0.02%)	4 (0.02%)	00:00:05	1.33
5	Quora	2 (0.01%)	3 (0.01%)	00:00:07	1.50
6	VKontakte	2 (0.01%)	2 (0.01%)	00:00:00	1.00
Seventh year					
1	Facebook	316 (59.62%)	652 (65.66%)	00:01:53	2.06
2	Instagram	126 (23.77%)	216 (21.75%)	00:00:27	1.71
3	VKontakte	33 (6.23%)	35 (3.52%)	00:01:20	1.06
4	YouTube	31 (5.85%)	49 (4.93%)	00:00:43	1.58
5	Twitter	15 (2.83%)	28 (2.82%)	00:01:52	1.87
6	LinkedIn	9 (1.70%)	13 (1.31%)	00:03:16	1.44

* About specific social media sites, Google Analytics provides information about the sessions only and not about New visitors ** Percentage of referrals from all social media sites

DISCUSSION

This is the first study to assess the long-term trends in the traffic sources, user details, and user behaviour of a mental health website in an Indian language. Its major findings are that the total number of visitors, the number of visits they make, and the time they spend on the site have decreased, though there is a mild increase in the number of pages they view in a session. Over the seven years, there are major changes in the kinds of devices and browsers most used and external, especially the social media, sources of visitors. The public is more interested in articles on love, sex, and marriage. All these findings have implications for mental health professionals, departments, institutions, and organizations that manage health information websites for the public.

Table 6 – Search engine keywords that brought >25 visitors to the site

	Keyword	New Visitors	Sessions	Bounce Rate	Pageviews /Session	Mean Session Duration
1	പ്രണയം (Love)	363	444	72.07%	1.56	00:02:22
2	പ്രണയം വിരഹം (Love separation)	325	420	87.38%	1.21	00:00:55
3	സ്ത്രീകളുടെ മനശാസ്ത്രം (Psychology of women)	268	325	88.92%	1.22	00:01:09
4	സ്ത്രീ മനശാസ്ത്രം (Women psychology)	198	245	82.04%	1.29	00:01:21
5	നല്ല വ്യക്തിത്വം (Good personality)	100	139	79.86%	1.42	00:02:11
6	പ്രണയത്തിന്റെ മനശാസ്ത്രം (Psychology of love)	98	144	85.42%	1.31	00:01:22
7	സ്വവർഗാനുരാഗം (Homosexuality)	56	63	88.89%	1.19	00:01:21
8	പ്രണയം എങ്ങനെ തിരിച്ചറിയാം (How to recognize love)	53	67	89.55%	1.13	00:00:26
9	ലൈംഗികവിദ്യാഭ്യാസം (Sex education)	43	47	85.11%	1.23	00:00:41
10	മനശാസ്ത്രം (Psychology)	36	46	65.22%	2.15	00:05:16
11	യോനി (Vagina)	27	35	74.29%	1.60	00:01:49

Table 7 – Details of ten articles that got the most number of visitors

Rank	Topic of the article	Year of publishing	Topic chosen by	Pageviews	Unique pageviews	Mean time on page
1	Psychology of love	2014	Publication	15451	13225	00:05:42
2	Misconceptions about sex education	2014	Publication	5635	5112	00:04:23
3	Techniques for personality improvement	2014	Publication	3495	2930	00:04:47
4	Marital and occupational stress in youth	2014	Publication	2354	205 9	00:04:26
5	Psychological aspects of marital infidelity	2015	Publication	1724	1312	00:03:19
6	Cognitive development of children	2014	Publication	1708	1533	00:04:20
7	Online habits of Keralites	2014	Publication	1241	1123	00:03:50
8	Psychology of happiness	2016	Author	1093	939	00:06:08
9	How mind affects sexual functioning	2014	Publication	1075	948	00:05:49
10	ADHD	2014	Publication	1045	825	00:02:39

Returning visitors had less bounce rate, viewed more pages per session, and had a higher mean duration for the sessions. This is because they return to the site as they found the content relevant and interesting. The fact that > 20% of the sessions are from returning visitors indicates a high level of interest in the site. In the study by Hammarberg et al. that assessed an information website on fertility, the proportion of returning visitors was 21%.[15] In the two studies on Canadian mental health portals, while Song et al.[6] did not provide the proportion of returning visitors, in the Jeong et al.[12] study, it was 12.89%.

The mean session duration was 2 minutes 18 seconds. The corresponding number for the Song et al.[6] study was 5 minutes 6 seconds, while Jeong et al.[12] did not provide this information. Song et al. obtained a higher mean session duration probably because the website they assessed, www.walkalong.ca, has much better resources at its disposal to create better quality content and promote the site to a highly targeted audience – It is managed by a group of researchers and practitioners at the University of British Columbia and has "generous" external funding.

More than a whopping 60,000 of the sessions lasted < 10 seconds. One possible reason is that non-Malayalam-speaking visitors who arrive at the site through search engines and other external sources immediately leave when they recognize the mistake. Another possibility is that when a webpage is slow to load, the users may not wait and rather decide to leave. The average page load time of this site was 12.59 seconds, which is low (The threshold Google recommends for e-commerce sites is two seconds).[16] The most likely reason for the slow loading of this site is that it is hosted on a shared server. A solution is to use dedicated servers, but they are costlier. Still, it may help visitor retention if website owners with sufficient funds opt for them.

On the positive side, about 6,000 users spent > 10 minutes at the site, probably indicating that they liked the content and accessed more than one article. However, concerns have been raised that long sessions may also be a result of the user keeping the webpage open while busy with unrelated activities.[6]

A drastic decrease happened in the number of visitors and their engagement with the site over the seven years (Table 1). No other study that assessed usage data over this period is available to compare these findings, but several causes can be speculated. Social media sites such as WhatsApp became very popular in this period,[17] and online, overall, people started preferring shorter write-ups. Also, with data becoming much cheaper in this period, people began using video-hosting sites such as YouTube to gather information,[18] brushing aside text-based sites like this. Also, after 2019, as the author got busy with other responsibilities, very few new articles were posted on the site. The slight increase observed in the number of pages viewed per session may be a good sign, but it may also indicate a superficial exploration of several pages.[6]

While in the first year, 77.20% of the users accessed the website from desktops, in the seventh year, 72.03% used mobile phones. No other study has compared the time trend in the type of device used to access a health information website. Presumably, the decreasing prices and the consequent increase in popularity of smartphones caused this change. In the Song et al. study, done between November 2013 and November 2014, a period that overlaps with the first year of this study, desktop users constituted 82.3%, a proportion not different from that obtained in this study. In the Jeong et al. study, the proportion of desktop users was 54.40%, but that was data for 2017 alone. In the study on the India against Cancer website, between 1st April 2017 and 31st March 2019, 64.8% of the new users used mobile phone. The slightly lower proportion they obtained, compared to what this study got in its seventh year, may be attributed to the fact that their study period was 2-3 years prior to the seventh year of this study, and smartphones may have become cheaper in this period.

This change has tremendous implications for owners of health information websites. If your site is not optimized for phones (with responsive design, Accelerated Mobile Pages versions, fast-loading pages, etc.), user engagement and even search engine rankings would suffer. Especially, websites created in the pre-2010 era might need a thorough technological and design overhaul to remain in the game and keep serving their purpose. Likewise, as browsers like Internet Explorer and Opera Mini have fallen out of favour and competitors like Safari and Samsung Internet have taken their place, it is imperative to test and ensure that a website is compatible with all popular browsers.

In the previous studies, too, the most traffic has been from the country where the website is based. In the Jeong et al. and Song et al. studies, 94.12% and 67%, respectively, of the visitors were from Canada itself. The countries other than India that sent the most traffic were from the middle east, which is expected in light of the huge Keralite population there (Table 2). It is satisfying to note that the visitors from India and the middle east countries had a mean session duration of > 2 minutes. The high bounce rates and low mean session duration for Western countries may be because the natives of those countries inadvertently reach the site through search engines and leave immediately. The high number of visitors from Maharashtra and Delhi, compared to other non-southern states (Table 3), may be explained by the high presence of Keralites in Mumbai and New Delhi.

The high number of direct visits to the site (Table 4) may be because of the "advertising" done through the author's visiting card, outside his outpatient clinic, and in his articles published in print. Even though the proportion is high, the actual number of direct visits has gone down, probably because, unlike in the past, new

articles are not being regularly added to the site.

For the Indian against Cancer website, too, the social media site that sent the most traffic was Facebook. The reason for the drastic decline in the proportion of visits to this site from social media, especially Facebook (Table 5), may be that these days very few new articles are shared there. Changes in the Facebook algorithm, which now prefers videos and inspirational, funny, and practical content, may have contributed too.[19]

For nine of the articles in the top-ten list, the topics were suggested by the publications (Table 7). Journalists are well aware of what the readers want. The above finding should inspire mental health professionals to liaise with journalists in recognizing topics that would be of interest to the masses. Once you have some such content, the readers may be pulled to your website and then may also get interested in articles on less juicy aspects of mental health and ill-health.

Limitations

Though the first of its kind, this study has some limitations:

- GA is not perfect in excluding visits by bots from its calculations,[20] and some of the traffic mentioned in this article may have been from bots.
- The site may have been unavailable for hours or even days due to server errors, and this was not measured or adjusted for in this analysis.
- It was not possible to analyze the sex or age group of the visitors because those data have not been recorded, probably due to incorrect settings.
- Most articles on the site are on topics suggested by the publications, and hence, its content does not represent the whole gamut of mental health topics. Besides, though the author has written a few articles on core psychiatry topics such as psychoses, depression, alcoholism, and cannabis, they are published on his institution's website and were not included in this analysis.
- The list of the top ten articles is dominated by those published in 2014, the first year. This may be because a "Most Popular" section is displayed at the top of all pages: Once an early article made it to the section, its prominence made it imperative that those articles keep getting many more clicks, in a "rich getting richer" fashion.
- As all the articles are from a single author and also because all the technical aspects are taken care of by the author himself, the findings may not be generalizable to other mental health websites. For example, multi-author websites may be more attractive to the visitors and may have a better user engagement. Also, sites that contain videos may get entirely different results.

Future Directions

GA data can be supplemented by surveys of users and even by using qualitative methods to find out ways to improve the attractiveness and performance of mental health education websites. Similar studies of multi-author websites and sites by organizations and departments too are needed. Recording and analyzing the keywords used to search within the website using the site search feature may give more insights into what the visitors want. This was a preliminary descriptive study only; future studies can consider checking hypotheses about changes in the pattern of use with time, association with sociodemographic variables, etc.

Implications

Professionals, departments, institutions, and organizations creating or maintaining websites that impart mental health awareness should remain vigilant about technological and social changes and update the websites accordingly. GA is a free tool they can use to obtain loads of data necessary for the purpose. Regularly adding useful content (rather than allowing the site to remain stagnant), spreading the links to the new content through social media sites popular at the time, getting links to one's website from other renowned websites, ensuring that the website is friendly to new kinds of devices and browsers, etc. may help one's educational website achieve its intended purpose.

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CONFLICT OF INTEREST

The author owns, funds, and manages the website under study. However, the website does not generate revenue of any sort.

REFERENCES

1. Srivastava K, Chatterjee K, Bhat PS. Mental health awareness: The Indian scenario. Ind Psychiatry J 2016; 25:131-4.
2. Kim Y. Trust in health information websites: A systematic literature review on the antecedents of trust. Health Informatics J 2016; 22:355-69.
3. Eysenbach G, Köhler C. How do consumers search for and appraise health information on the world wide web? Qualitative study using focus groups, usability tests, and in-depth interviews. Br Med J 2002; 324:573–7.
4. Yadav K, Upadhyay S, Chandra A, Hariprasad R, Gupta R, Mehrotra R, et al. Evaluation of 'India against Cancer' web portal using environmental scan and Google Analytics. Int. J. Sci. Res. in Network Security and Communication 2020; 8:14-20.
5. Kirk M, Morgan R, Tonkin E, McDonald K, Skirton H. An objective approach to evaluating an internet-delivered genetics education resource developed for nurses: using Google Analytics™ to monitor global visitor engagement. J Res Nurs 2012; 17:557-79.
6. Song MJ, Ward J, Choi F, Nikoo M, Frank A, Shams F, et al. A process evaluation of a web-based mental health portal (WalkAlong) using google analytics. JMIR mental health. 2018;5:e50.
7. King K, Schlichthorst M, Turnure J, Phelps A, Spittal MJ, Pirkis J. Evaluating the effectiveness of a website about masculinity and suicide to prompt help-seeking. Health Promot J Austr 2019; 30:381-9.
8. Gesualdo F, Marino F, Mantero J, Spadoni A, Sambucini L, Quaglia G, et al. The use of web analytics combined with other data streams for tailoring online vaccine safety information at global level: The Vaccine Safety Net's web analytics project. Vaccine 2020; 38:6418-26.
9. Butler MW, Krishnaswami S, Minocha A. The global paediatric surgery network: early measures of interest in the website. Eur J Pediatr Surg 2012; 22:80-4.
10. McCloskey EV, Johansson H, Harvey NC, Compston J,Kanis JA. Access to fracture risk assessment by FRAX and linked National Osteoporosis Guideline Group (NOGG) guidance in the UK-an analysis of anonymous website activity. Osteoporos Int 2017; 28:71-6.
11. Khanna R, Karikalan N, Mishra AK, Agarwal A, Bhattacharya M, Das JK. Repository on maternal child health: health portal to improve access to information on maternal child health in India. BMC Public Health 2013; 13:1-10.
12. Jeong D, Cheng M, St-Jean M, Jalali A. Evaluation of eMentalHealth.ca, a Canadian mental health website portal: mixed methods assessment. JMIR Ment Health 2019; 6:e13639.
13. Crutzen R, Roosjen JL, Poelman J. Using Google Analytics as a process evaluation method for Internet-delivered interventions: an example on sexual health. Health Promot Int 2013; 28:36-42.
14. Clark D, Nicholas D, Jamali HR. Evaluating information seeking and use in the changing virtual world: the emerging role of Google Analytics. Learn Pub 2014; 27:185-94.
15. Hammarberg K, Norman RJ, Robertson S, McLachlan R, Michelmore J, Johnson L. Development of a health promotion programme to improve awareness of factors that affect fertility, and evaluation of its reach in the first 5 years. Reprod Biomed Online 2017; 4:33-40.
16. Blue Corona. How fast should a website load? [Internet]. [place unknown] [updated 24 Nov 2019; cited 2021 Apr 28] Available from: https://www.bluecorona.com/blog/how-fast-should-website-be/
17. Singh, M. WhatsApp reaches 400 million users in India, its biggest market. [Internet]. [place unknown] Tech Crunch [updated 26 Jul 2019; cited 2021 Apr 28] Available from: https://techcrunch.com/2019/07/26/whatsapp-india-users-400-million/
18. ETBrandEquity. Exploring the emerging viewership trends in India on Youtube. [Internet]. [place unknown] Economic Times. [updated 22 Jun 2018; cited 2021 Apr 28] Available from: https://brandequity.economictimes.indiatimes.com/news/media/exploring-the-emerging-viewership-trends-in-india-on-youtube/64696938
19. Read, A. The state of social 2019 report: new data and social media marketing research. [Internet]. [place unknown] [updated 22 Jan 2019; cited 2021 Apr 28] Available from: https://buffer.com/resources/the-state-of-social-2019-report-new-data-and-social-media-marketing-research/
20. How to exclude bot traffic from Google Analytics (and why it's not enough). [Internet]. [place unknown] [cited 2021 Apr 28] Available from: https://datadome.co/bot-management-protection/exclude-bot-traffic-from-google-analytics/

Case Report

A CASE REPORT ON CASPR2 POSITIVE AUTOIMMUNE ENCEPHALITIS PRESENTING AS DELIRIUM IN AN ALCOHOL-DEPENDENT PATIENT: A DIAGNOSTIC DILEMMA

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ABSTRACT

Delirium, a major psychiatric emergency commonly encountered in alcohol withdrawal state, can have various aetiologies. Here we present a case of protracted delirium in an alcohol dependent patient, which on detailed neurological workup was diagnosed to be autoimmune encephalitis with CASPR2 (contactin-associated protein-like 2) antibodies. Subsequent treatment with immunotherapy and steroids lead to the resolution of symptoms.

Keywords: Delirium, autoimmune encephalitis, alcohol withdrawal, CASPR2

INTRODUCTION

Delirium in an alcohol dependent patient can have multifactorial aetiology. Alcohol withdrawal state, metabolic abnormalities like hypoglycaemia and electrolyte imbalance, infection, trauma causing intracerebral and subdural haemorrhages, Wernicke's encephalopathy and hepatic encephalopathy are the common etiologies. They are usually explored and addressed at the initial presentation of delirium.[1] However, protracted delirium poses a diagnostic challenge to clinicians and causes significant morbidity to the patient.[2] Autoimmune encephalitis is a clinical entity that can have complex neurological presentations, including delirium, seizures, and psychosis. Anti-CASPR2 antibody has been recently recognised as associated with autoimmune encephalitis, with less than 100 cases being reported so far.[3] Here, we present a case of protracted delirium in an alcohol dependent patient, which was diagnosed to be anti-CASPR2 positive autoimmune encephalitis, on initiating treatment for which resolution of symptoms was achieved.

CASE REPORT

68 year old single male, living alone, presented with features suggestive of alcohol dependence for 20 years with no past history of withdrawal seizures or delirium. Family members reported that they had noticed an increased intake of alcohol for the last six months and that the patient started having tremors even during periods of continuous alcohol intake. They also noticed unsteadiness of gait, which they attributed to a fall and was not evaluated. Two days before admission, the patient was found unresponsive on the road with faecal incontinence. Family members who reached the spot noticed that patient was confused and had difficulty walking. The patient was brought to the Gastromedicine outpatient department the next day.

According to the patient's report, the last intake of alcohol was three days before admission. The possibility of an episode of alcohol withdrawal seizures was

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considered initially, and he was admitted for evaluation. He was afebrile with a pulse rate of 98/min and blood pressure of 150/100 mm Hg. Complete blood counts, electrolytes, sugars, blood urea, and serum creatinine were normal. Serum bilirubin (1.5mg/dL), AST (95 IU/L) and ALT(50 IU/L) were mildly elevated. USG abdomen showed features of chronic liver disease. evening, the patient was noted to have worsening of sensorium with agitation, hallucinatory behaviour and disturbed sleep. The patient was provisionally diagnosed to have alcohol withdrawal delirium. Parenteral thiamine supplementation at a dose of 100 mg three times a day was initiated. On the Clinical Institute of Withdrawal Assessment of Alcohol Scale (CIWA-Ar), the patient was noted to have a score of 26 and was started on Lorazepam 12 mg in divided doses. Subsequent titration in the dose of Lorazepam was done based on CIWA-Ar scores. The patient was transferred to psychiatry as he was unmanageable in the Gastromedicine ward. The dose of thiamine was increased to 1500mg per day. A low dose of antipsychotic (quetiapine 25mg twice daily) was added to control agitation. Even after continuing the treatment for ten days, the patient persisted to have disorientation and ataxia; neurological findings of rigidity of upper limbs and bradykinesia were also noted. Mini-Mental State Examination (MMSE) score was noted to be 10. A neurology consultation was sought, and Magnetic Resonance Imaging (MRI) was advised. MRI showed no features suggestive of Wernicke's encephalopathy. The electroencephalogram (EEG) was within normal limits. As a result, a secondary workup was done. Serum autoimmune panel showed positivity for CASPR2 (contactin-associated protein-like 2) antibody, and all other antibodies were negative. Cerebrospinal fluid (CSF) autoimmune and paraneoplastic panel was normal. A whole-body PET CT was done to rule out any underlying malignancy, which was found normal. The patient was started on iv immunoglobulin therapy and a pulse dose of iv methylprednisolone for five days, followed by oral steroids. The patient showed symptomatic improvement over the next one week and was discharged. On follow-up, the patient had an MMSE score of 28 and was found to be maintaining the improvement. A limitation of this case report is that since the patient had no reliable informant, there are deficiencies in the history obtained. Informed consent was taken from the patient for the write-up of this report.

DISCUSSION

Protracted delirium in an alcohol dependent patient requires special attention to exploring etiologies, including uncommon causes. Autoimmune encephalitis can be a rare cause of protracted delirium. It has been broadly divided into two main categories, those associated with intracellular neuronal antibodies and those associated with cell membrane antibodies.[4] Voltage-gated potassium channel complex (VGKC) plays an important role in restoring the cell to its resting state following an action potential. Antibodies against VGKC, which are present on the neuronal membranes of both the central and peripheral nervous system, were initially thought to be associated with autoimmune syndromes like Morvan syndrome, neuromyotonia, and limbic encephalitis. However, subsequent research showed that antibodies were not directed to VGKC but associated proteins, including leucine-rich glioma inactivated 1(LGI1) and contactin-associated protein-like2(CASPR2). Patients with LGI1 antibodies present with limbic encephalitis, often associated with hyponatremia and faciobrachial dystonic seizures.[3] Patient with CASPR2 antibodies are predominantly older males and can present with a wide variety of peripheral or central nervous system symptoms. It can also be associated with malignancies, especially thymoma, seen in 20% of the patients.[5] Cognitive disturbances, cerebellar symptoms, seizures, insomnia, autonomic dysfunction, weight loss, peripheral neuropathy, peripheral nerve hyperexcitability, and neuropathic pain are among the frequently observed symptoms.[6],[7] Since many of these symptoms are also present in a patient with alcohol withdrawal delirium, it can be arduous for the clinician to reach this diagnosis, especially at the initial presentation. In our patient, predominantly central nervous system symptoms were present, associated with CASPR2 antibodies. However, LGI1 antibodies were found to be negative. Immunotherapy is the treatment of choice in encephalitis associated with either of these antibodies.[8]

CONCLUSION

Despite addressing commonly associated etiologies, the persistence of delirium in an alcohol withdrawal patient necessitates a detailed neurological workup to look for rare autoimmune and paraneoplastic etiologies as well.

Timely diagnosis and intervention can considerably reduce morbidity and possible mortality in this set of patients.

REFERENCES

1. Fong TG, Tulebaev SR, Inouye SK. Delirium in elderly adults: diagnosis, prevention and treatment. Nat Rev Neurol. 2009 Apr;5(4):210–20.
2. Dasgupta M, Hillier LM. Factors associated with prolonged delirium: a systematic review. Int Psychogeriatr. 2010 May;22(3):373–94.
3. van Sonderen A, Schreurs MWJ, Wirtz PW, Sillevis Smitt PAE, Titulaer MJ. From VGKC to LGI1 and Caspr2 encephalitis: The evolution of a disease entity over time. Autoimmun Rev. 2016 Oct;15(10):970–4.
4. Paul B, Paul G, Singh G, Bansal R. Autoantibody-induced encephalitis. Int J Nutr Pharmacol Neurol Dis. 2014;4(5):44.
5. Irani SR, Pettingill P, Kleopa KA, Schiza N, Waters P, Mazia C, et al. Morvan syndrome: Clinical and serological observations in 29 cases. Ann Neurol. 2012 Aug;72(2):241–55.
6. van Sonderen A, Ariño H, Petit-Pedrol M, Leypoldt F, Körtvélyessy P, Wandinger K-P, et al. The clinical spectrum of Caspr2 antibody–associated disease. Neurology. 2016 Aug 2;87(5):521–8.
7. Ellwardt E, Geber C, Lotz J, Birklein F. Heterogeneous presentation of caspr2 antibody-associated peripheral neuropathy – A case series. Eur J Pain. 2020 Aug;24(7):1411–8.
8. van Sonderen A, Petit-Pedrol M, Dalmau J, Titulaer MJ. The value of LGI1, Caspr2 and voltage-gated potassium channel antibodies in encephalitis. Nat Rev Neurol. 2017 May;13(5):290–301.

Case Report

HYPERMOTOR SEIZURE PRESENTING WITH UNUSUAL PSYCHIATRIC SYMPTOMS - A CASE REPORT

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ABSTRACT

We report a case of hypermotor seizure activity. The patient presented behavioural changes with previous reports of normal electroencephalogram (EEG). A prolonged video EEG of this patient showed rare epileptic abnormalities over the left frontocentral region, which ruled out a conversion disorder diagnosis. Management using Antiepileptics proved beneficial in this case.
Keywords: hypermotor seizure, unusual symptoms, psychiatric

INTRODUCTION

Hypermotor seizures (HMS) are primarily characterised by complex behaviour involving proximal segments of the limbs and trunk, producing pedalling, kicking, pelvic thrusting or rocking movements.[1,2] This seizure behaviour can be triggered by epileptogenic foci in the frontal lobe[3,4], the temporal lobe[5], or the insular lobe.[6] Here, we discuss an unusual presentation of hypermotor seizures misdiagnosed multiple times as conversion disorder and treated for the same.

CASE DESCRIPTION

A 19-year-old boy was presented to the Psychiatry department with the history of episodes in which he becomes scared suddenly and will feel that his surroundings are not real. These episodes have been present since he was ten years of age. Parents noticed that whenever the patient was having an episode, he would stay still for some time and then continue playing. He would have 1-2 episodes/month with each episode lasting only for a few seconds. A neurologist was consulted, and an Electroencephalogram (EEG) was done. The reports of which were told to be normal. There was no past or family history of any seizure.

These episodes continued, but by the end of high school, the patient started having symptoms in which he would feel scared suddenly, and he will scream and pace around aimlessly for a few seconds. After the episodes, he would not remember what has happened. These episodes continued with a frequency of 2-3 /month. He then started college, but he stopped going to college within three months because of similar episodes. The patient then started reporting low mood, feeling useless in life, hopelessness and passive death wishes. The patient was again taken to a neurologist, who ordered video EEG which had only non-specific changes. The patient was unwilling to go back to college. The patient was taken to a psychiatrist who started him on Risperidone 3mg, Mirtazapine 7.5mg, Sodium Valproate 500mg, and a diagnosis of Psychogenic nonepileptic seizure (PNES) were made. But there was no improvement with the medications. After stopping all the medicines, he maintained well until three months ago when he again started having similar episodes at night. Parents reported that while the patient was asleep in his bed all of a sudden, they hear a scream from the patient's room, and they find him pacing around the

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room or rolling on the bed continuously for a few seconds. When they tried to restrain him, they felt his body stiff and reported that it required significant effort to hold him down. The frequency of these night episodes had increased during the last three weeks. Finally, one day, the patient had an episode while talking to a neighbour outside his house about his academics. He felt fearful, cried out loudly and ran home in the middle of the conversation.

At the department, while waiting outside, he had an episode in which he made a loud cry and started pacing around the corridor which lasted for a few seconds. The patient looked perplexed and could not remember the event. The patient was admitted to the ward and was given IV lorazepam to pacify him. The patient also reported experiencing low moods, decreased sleep, hopelessness, and helplessness during the previous 1month. A provisional diagnosis of Dissociative disorder was kept. A neurology opinion was taken and was advised 12-hour Video Electroencephalogram (VEEG). The record showed a mild degree of non-specific electrical dysfunction over the left frontotemporal region and rare epileptic abnormalities over the left frontocentral region. Recorded 14 habitual electroclinical events were suggestive of hypermotor seizures along with an aura of fear.

After loading with Lacosamide 400mg, then with Leviteracem 1h, his seizures decreased. However, he continued to have similar events. He was loaded with IV Fosphenytoin 1.5 gm, following which he did not have any events, and repeated prolonged EEG did not reveal any epileptiform abnormality or events. A diagnosis of hypermotor seizure originating from the frontal-temporal and frontocentral area was made. The patient was initially started on carbamazepine, on which he developed rashes, so it was stopped, and the neurologist started phenytoin 300mg. Since he continued to have episodes, Lacosamide 400mg was added. Since he developed further episodes, a third AED, Brivaracetam 100mg, was added. Escitalopram 10mg was started for his depressive symptoms. After discharge from the hospital, the patient did not have any further episodes and maintained well for the last six months.

DISCUSSION

Here we present a rare case of hypermotor seizures that masqueraded as a dissociative seizure for a prolonged period in a young individual, starting from childhood. HMS is characterised by complex high amplitude movements involving the body's proximal segments, resulting in violent body movements like beating, kicking, screaming, boxing, and pelvic thrusting.[7] Previous literature shows how challenging it is to diagnose frontal lobe epilepsy from dissociative seizures.[8] Due to bizarre characteristics, quick postictal recovery happens with preserved consciousness. Absence of a clear cut ictal pattern in scalp EEG often results in misdiagnosis as dissociative seizures.[8] Sleep-related hyper motor seizures are often misdiagnosed as NREM arousal disorders (e.g. sleepwalking, sleep terror).[9] Some affective psychic seizures might involve complex distortion of perception of time, self and surroundings may cause subtle changes in consciousness, reduction in awareness and responsiveness.[9] In our patient, though symptoms started at childhood with day time episodes of feeling scared and unreal, the motor component developed later on. The initial presentation was only during the daytime, and later on, the patient started having both day and night episodes which make the presentation of hypermotor seizures more unusual. Though the patient had undergone multiple EEGs, a prolonged Video EEG would have captured the semiology.

Psychological factors cause dissociative motor disorder as conflicts or other stressors precede the illness.[10] Interestingly, none of the symptoms reported in this patient had any indication that this might be a seizure with the root cause in the brain, especially at onset and the type of symptoms being experienced. These symptoms were associated with significant stress and other mood symptoms. Unfortunately, none of the EEGs performed in the past showed any findings suggestive of brain pathology. This might be attributed to deep-seated pathology, treatment with valproate, or not doing a prolonged video EEG to capture an event.

CONCLUSION

Epilepsy includes a variety of neuropsychiatric symptoms. Misdiagnosis may be more common in patients with gait and movement disorders and those with a psychiatric history. Psychiatrists must be aware of these varied presentations while obtaining medical history to investigate and manage these patients effectively. Maintaining a high index of suspicion and judicious anticonvulsant therapy in suitable candidates would be beneficial in such situations.

REFERENCES

1. Rao MB. Addressing the burden of epilepsy in India…. Neurol India 2017;65: S4-5.
2. Wang X, Hu W, Zhang K, Shao X, Ma Y, Sang L, et al. The anatomo-electrical network underlying hypermotor seizures. Front Neurol. 2018; 9:243.
3. Guedj E, McGonigal A, Vaugier L, Mundler O, Bartolomei F. Metabolic brain PET pattern underlying hyperkinetic seizures. Epilepsy Res. 2012;101(3):237–45.
4. Rheims S, Ryvlin P, Scherer C, Minotti L, Hoffmann D, Guenot M, et al. Analysis of clinical patterns and underlying epileptogenic zones of hypermotor seizures. Epilepsia. 2008; 49(12):2030–40.
5. Arain AM, Azar NJ, Lagrange AH, McLean M, Singh P, Sonmezturk H, et al. Temporal lobe origin is common in patients who have undergone epilepsy surgery for hypermotor seizures. Epilepsy Behav. 2016; 64(Pt A):57–61.
6. Ryvlin P, Minotti L, Demarquay G, Hirsch E, Arzimanoglou A, Hoffman D, et al. Nocturnal hypermotor seizures, suggesting frontal lobe epilepsy, can originate in the insula. Epilepsia. 2006;47(4):755–65.
7. Tinuper P, Bisulli F, Cross JH, Hesdorffer D, Kahane P, Nobili L, et al. Definition and diagnostic criteria of sleep-related hypermotor epilepsy. Neurology. 2016;86(19):1834-42.
8. Tinuper P, Provini F, Bisulli F, Vignatelli L, Plazzi G, Vetrugno R, et al. Movement disorders in sleep: Guidelines for differentiating epileptic from nonepileptic motor phenomena arising from sleep. Sleep Medicine Reviews. 2007;11(4):255–67.
9. Derry CP, Davey M, Johns M, Kron K, Glencross D, Marini C, et al. Distinguishing Sleep Disorders From Seizures. Arch Neurol. 2006;63;705-9.
10. Lesser RP. Treatment and Outcome of Psychogenic Nonepileptic Seizures. *Epilepsy Curr*. 2003;3(6):198-200.

Case Series

HIDDEN IN THE RASH - ALCOHOLIC PELLAGRA ENCEPHALOPATHY

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ABSTRACT

Pellagra Encephalopathy is a recognised medical condition due to niacin deficiency. Patients with alcohol dependence invariably have vitamin deficiencies, including niacin. Pellagra Encephalopathy can be challenging to diagnose alongside withdrawal delirium. Diarrhoea, skin rashes, memory and attention deficits, paraesthesia and proximal muscle weakness were noted in four patients diagnosed with delirium tremens. Atypical features such as cognitive and neurological deficits were understood as the presentation of pellagra encephalopathy. The presence of neuro-cognitive symptoms in addition to typical dermatological presentation guided consideration of pellagra encephalopathy comorbid with delirium due to alcohol withdrawal. Subtle neurological symptoms indicative of pellagra encephalopathy may be overlooked in patients with delirium.

Keywords: Pellagra, Encephalopathy, Alcohol withdrawal

INTRODUCTION

Pellagra is a medical condition characterised by its typical rash and a triad of diarrhoea, dermatitis, dementia (delirium) due to the deficiency of vitamin B3 (niacin). Nutritional pellagra is rare in developed countries but remains prevalent in the developing world.[1] More recently, pellagra is seen to be associated with conditions like chronic alcohol abuse, anorexia nervosa, and schizophrenia, where patients may have poor oral intake resulting in the deficiency of niacin and other vitamins.[2] In western countries, cases of pellagra are most commonly reported in association with chronic alcohol abuse.[3] Therefore, in the developing world, where nutritional deficiencies are prevalent, pellagra and its complications are seen among patients with chronic alcohol use. One among the *3 Ds* of pellagra is dementia, which is a misnomer as the description mostly fits one of delirium, with memory deficits.[4] Hence vitamin B3 deficiency can present as delirium or encephalopathy. This poses a dilemma among patients with acute alcohol withdrawal, as alcohol withdrawal, delirium tremens, and Wernicke's encephalopathy can all present with delirium. It is challenging to isolate pellagra encephalopathy in such cases. Pellagra, because of chronic alcohol use, has been referred to as *pseudo pellagra.*[5] *Pellagra sine pellagra* is also a recognised entity wherein pellagra can present without the characteristic rash in patients with alcohol dependence.[6] It might hence be overlooked, which may lead to further morbidity and mortality. We report four patients with alcohol dependence syndrome and comorbid pellagra to

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highlight the challenges in differentiating pellagra encephalopathy from delirium tremens and Wernicke's encephalopathy.

CASE DESCRIPTIONS

Case 1

Mr K was a 40-year-old married male from a lower socio-economic urban background. He was initially admitted to dermatology to treat skin lesions and transferred to psychiatry as he was found to be disoriented. He had been consuming alcohol for over 20 years, with features suggestive of dependence over the last 5 to 6 years. The average intake of alcohol was 12 to18 units of spirits a day. He developed hyper-pigmented skin lesions on the extensor aspects of his forearm and neck that were noticed around two weeks before the admission. He also had paraesthesia over his palms and soles and developed diarrhoea during hospitalisation.

Physical examination revealed tachycardia, pallor, generalised tremors, and increased sweating. Mr K had hyperpigmented scaly skin lesions with peeling off scales on sun-exposed areas of bilateral forearms and neck (Casal's necklace) (Figure 1). He was disoriented to time, place and person, along with impaired attention, registration and recent memory.

No infective cause was found for diarrhoea. Mr K had instances of urinary incontinence while in the hospital. His liver function (LFT) was deranged, ultrasound scan of the abdomen showed hepatomegaly and grade 2 fatty changes. Confusion resolved over three days, but he continued to have deficits in attention and recent memory over the subsequent five to seven days.

Figure 1. Figure showing Casal's necklace in case 1(Mr. K)

Case 2

Mr S was a 38-year-old married male from a lower socio-economic status rural background. He had been consuming alcohol for the last 18 to 20 years and in a dependence pattern over the last 12 years. Average use was around 18 units of spirits a day, and over the previous year, his use had increased to 24 to 36 units a day with reduced food intake. In the preceding two years, he had seizures on two instances due to alcohol withdrawal. Additionally, there was a history of excessive fatigue, difficulty standing up from sitting and squatting positions and diarrhoea in the week prior to the initial consultation. He reported numbness and tingling over his hands and feet. His last drink was three days prior to the day of admission.

On initial evaluation, Mr S was found to have tachycardia, generalised tremors, excessive sweating. He had hyperpigmented scaly lesions over his hands and feet over the dorsum and the anterior aspect of his neck (Casal's necklace). Neurological examination revealed proximal muscle weakness with mild wasting of lower limbs and cerebellar signs. He was disoriented to time and place. His attention and recent memory were impaired, and he reported auditory hallucinations.

Case 3

Mr X was a 40-year-old married male from a lower socio-economic rural background. He was admitted with delirium and diarrhoea. He was previously diagnosed to have alcoholic hepatitis. He had been using alcohol for 20 years, with features suggestive of dependence for ten years with an average consumption of 20 to 22 units of spirits a day.

Figure 2. Hyperpigmented desquamating lesions on the dorsum of hand in Case 4 (Mr Y)

On examination, the patient was disoriented, dehydrated and had pallor and icterus. He had scaly hyper-pigmented dry skin lesions on the dorsum of hands and feet. He was found to have tachycardia, generalised tremors and non-tender hepatomegaly. His attention and memory for recent events were impaired. Liver function tests revealed unconjugated bilirubinaemia with deranged liver enzymes. Abdominal ultrasound revealed hepatomegaly.

Case 4

Mr Y was a 40-year-old married male from a lower socio-economic rural background. He was admitted with delirium, tremors and restlessness for a week. He had been using alcohol for the past twenty years, with use suggestive of a dependence pattern in the past ten years. He consumed about 18 to 24 units of spirits a day. He developed erythematous, desquamating rashes on both upper limbs (figure 2) and dorsum of feet over the few weeks preceding admission.

On examination, he was disoriented, dehydrated, and icteric. He had scaly hyperpigmented dry skin on the dorsum of hands and feet. Hepatomegaly was present. He had thrombocytopenia, hypokalaemia and liver function test showed deranged liver enzymes.

Management

All four patients were initially diagnosed with delirium tremens due to complicated alcohol withdrawal. Dermatologist's opinion was sought for the skin lesions and was confirmed to be pellagra. All four patients were managed with tapering dosages of diazepam or lorazepam for detoxification. Initially, thiamine (500mg thiamine in 100 ml normal saline thrice a day) and nicotinamide (300mg per day) were administered parenterally, subsequently changed to an oral formulation. Based on the dermatologist's opinion, topical zinc was used for skin lesions. Reorientation strategies and supportive care were provided according to standard protocols for the management of delirium.

Initial changes were noticed in terms of improvement in delirium and mental status over three to four days. In most of the patients, rash improved over ten days. All patients were reviewed two weeks after discharge. Although cognitive functions improved over the two weeks, the majority of the patients had persisting deficits in memory and attention. Two patients had persistent paresthesia, and one had persistent proximal muscle weakness. In the subsequent scheduled review after one month, the two patients who remained in follow up reported further improvement.

DISCUSSION

Predisposing factors in these patients were that they were all from lower socio-economic status and had been using alcohol in a dependence pattern for at least five years prior to this admission.[7] Additionally, they all presented with delirium and had deficits of attention and memory. They also presented with the characteristic skin lesions of pellagra. In terms of treatment response, all showed improvement in cognitive functions and physical parameters with nicotinamide (niacin). As they also had paraesthesia, incontinence, cerebellar signs, apathy and hallucinations, the possibility of pellagra encephalopathy was considered. As the patients were in acute withdrawal delirium, it was impossible to conclude that they had isolated pellagra encephalopathy.

Among patients with alcohol use, pellagra can often present without the rash (*pellagra sine pellagra*) or with delirium solely. This can result in pellagra encephalopathy being overlooked as an independent diagnosis or as comorbid to delirium tremens and Wernickes' encephalopathy. It is important to consider pellagra as one of the differential or comorbid diagnoses, as it is a treatable cause of morbidity and mortality in such patients.[8]

Niacin functions as a coenzyme in a variety of biological redox reactions in the forms of Nicotinamide Adenine Dinucleotide – Hydrogen (NADH) and Nicotinamide Adenine Dinucleotide Phosphate Hydrogen (NADPH). Alcohol can hinder the conversion of tryptophan to niacin by inhibiting liver tryptophan 2,3–dioxygenase enzyme thus prevents the subsequent formation of niacin precursors. Acetaldehyde which is a by-product of alcohol metabolism, can inactivate pyridoxal 5-phosphate. This enzyme also plays a vital role in the generation of niacin precursors in the kynurenine pathway. Alcohol, through multiple biochemical interactions with key enzymes in the kynurenine pathway, can produce niacin deficiency.[9]

As one of the presenting features of pellagra in patients with chronic alcohol use can be delirium, it is essential to have a high index of suspicion. In a patient with alcohol withdrawal delirium, the emergence of

extrapyramidal signs like cog-wheel rigidity should raise suspicion of pellagra encephalopathy. Other neuropsychiatric features observed in pellagra encephalopathy are myoclonus, cerebellar signs, apathy, paraesthesia, depression, dizziness, hallucinations, seizures, gait disturbance and incontinence.[9] As presented in this series, some of these features were present in all the cases, thereby leading to a consideration of pellagra encephalopathy. Although pellagra's characteristic features like dermatitis were present in this case series, which aided the diagnosis, it is important to note that pellagra can present without the characteristic *3Ds*.

Conclusion

Malnourished male patients with alcohol dependence may present akin to the cases described. In addition to considering thiamine deficiency, it is also important to evaluate other B vitamin deficiencies, including niacin which may present as encephalopathy. A high index of suspicion is key in the diagnosis of pellagra encephalopathy in this cohort. Prompt identification and management of the same can prevent adverse outcomes.

REFERENCES:

1. Pitche PT. Pellagre et érythèmes pellagroïdes. Cah Détudes Rech Francoph. 2005;15(3):205–208.
2. Cresce ND, McManus KA, Sifri CD, Wilson BB. Encephalopathy despite thiamine repletion during alcohol withdrawal. Cleve Clin J Med. 2014;81(6):350–352.
3. Mothukuri J, Chennamsetty S, Bhogaraju A. Pellagra in patient with schizophrenia: a case report and review of literature. AP J Psychol Med. 2013;14(1):50–2.
4. Oldham MA, Ivkovic A. Pellagrous encephalopathy presenting as alcohol withdrawal delirium: a case series and literature review. Addict Sci Clin Pract. 2012;7(1):12.
5. Guthrie RH. A Review of Cases of Pellagra Admitted to the Boston Psychopathic Hospital from 1922 to 1928 with Special Reference to Alcohol as an Etiological Factor. N Engl J Med. 1929;201(9):414–420.
6. Roberts SR. Pellagra: its symptoms and treatment. Am J Nurs. 1920;885–890.
7. Mahajan SK, Aundhakar SC. A study of the prevalence of serum vitamin B12 and folic acid deficiency in Western Maharashtra. J Fam Med Prim Care. 2015;4(1):64.
8. Ginnaio M, Jacobs A. Pellagra in late nineteenth century Italy: effects of a deficiency disease. Population. 2011;66(3):583–609.
9. Badawy AA-B. Pellagra and alcoholism: a biochemical perspective. Alcohol Alcohol. 2014;49(3):238–250.

Case Report

STEVENS-JOHNSON SYNDROME WHILE ON LAMOTRIGINE AND NSAID: A CASE REPORT

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ABSTRACT

Stevens-Johnson syndrome is a severe immune-mediated cutaneous reaction occurring due to exposure to certain drugs. Lamotrigine is an FDA approved drug used in the treatment of bipolar depression. When it is given concomitantly with sodium valproate, the risk of developing Stevens-Johnson syndrome increases. Here we present the report of a patient with bipolar depression who developed serious skin rashes while on lamotrigine and NSAID prescribed by a local doctor, who recovered after timely management. This case highlights the importance of following proper dosing, drug escalation regimen and managing drug interactions during lamotrigine therapy.

Keywords: Bipolar depression, Stevens-Johnson syndrome, Lamotrigine, Sodium Valproate, NSAID

INTRODUCTION

Stevens-Johnson syndrome (SJS) is a severe immune-mediated cutaneous reaction.[1] The incidence of SJS is one to two cases per one million population.[2] It usually occurs due to drug reactions but can occur due to infection with Mycoplasma pneumoniae.[1] Allopurinol, carbamazepine, phenytoin, phenobarbital, lamotrigine, sulfonamides, nevirapine and oxicam-NSAIDs are the drugs that are highly suspected of causing SJS. Weaker association have been found for aminopenicillins, cephalosporins, paracetamol and quinolones.[2, 3]

Lamotrigine is an antiepileptic drug used in the treatment of Lennox-Gastaut syndrome, migraine, and neuropathic pain. It is an FDA approved drug for the treatment of bipolar depression in psychiatry.[4] It acts by blocking voltage-gated sodium and calcium channels. It also has antiglutamate, antiaspartate, 5-HT3 antagonism and neuro protective action.[5] The adverse effects commonly seen include dizziness, headache, diplopia, ataxia, nausea, amblyopia, somnolence, vomiting and rash.[6] It is found that 0.1-1% of patients can develop severe dermatologic reactions. Lamotrigine related rash usually occurs between five days and eight weeks after drug exposure.[7]

We present an interesting case of Stevens-Johnson Syndrome (SJS) while on lamotrigine.

CASE REPORT

Written informed consent was taken for publishing and displaying the photographs of the rash without revealing the identity.

Mr X, a 57-year-old man, presented to the psychiatry department with pervasive low mood, lack of interest in

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previously pleasurable activities, easy fatiguability, insomnia and reduced appetite for a month following a

financial loss. He was on sodium Valproate 1000mg/day and escitalopram 10mg tablets. He was diagnosed to be having bipolar affective disorder for the past 30 years. Family members reported a history of three depressive episodes in the past following stressors, each episode lasting for two to three months. They also reported hypomanic/ manic episodes during which he used to talk more, be argumentative, and spend money unnecessarily without discussing with family members, which was not his usual self. The patient used to consume alcohol and smoke cigarettes daily in a dependence pattern for the last10 years. The last use of the substance was one month back. He has co-morbid Type 2 diabetes mellitus and systemic hypertension, for which he is on regular treatment. The patient's elder son was diagnosed with intellectual disability during his childhood which added to his stress.

On Mental Status Examination, the patient had reduced psychomotor activity and speech. His mood was sad, and his affect was depressed. The patient had death wishes, ideas of hopelessness, helplessness, and worthlessness. The patient was admitted with the above complaints and was diagnosed to have Bipolar affective disorder- current episode severe depression without psychotic symptoms. As it was a breakthrough episode while on sodium valproate 1000 mg and was developing severe depressive episodes, he was started on Tab. Lamotrigine 25mg, which was gradually increased to 100mg over a period of five weeks. Tab Escitalopram 10mg was added in view of depression, and antihypertensives and oral hypoglycaemic agents were continued. The patient was hospitalized for six weeks and was discharged. At the time of discharge, he showed 50% improvement in his depressive symptoms as per the serial Mental Status Examination. We found that patient was taking medications regularly and was going to work.

After one month, the patient had consulted a local doctor for shoulder pain, for which he was given analgesic medications, the details of which were not available. After two days, the patient developed small red rashes over his chest and back. It spread rapidly to his extremities and face the next day. The patient had severe pain and had difficulty swallowing even liquids. The rashes involved his eyes, lips, ears and genitals too. His skin started to peel on the second day and had even bleedings from the open skin areas. The patient had stopped taking food from the third day and could not get up from his bed. On the fourth day, the patient had confused behaviour, irrelevant talk, and disturbed sleep. For these complaints, he was brought again for admission.

Figure 1. Lesions involving face, chest, and limbs with exfoliation of the skin. The patient had difficulty opening his eyes and mouth, along with difficulty in swallowing.

Figure 2. Lesions involving the back with exfoliation of the skin.

On examination, the patient had diffuse erythematous and purpuric rashes and vesiculobullous eruptions throughout the body, involving the skin, mucous membrane, oral cavity, and genitals. Nikolsky sign was positive on examining the erythematous areas of the

skin. Skin detachment involved less than 10% of the body surface area. Emergency dermatology and physician opinion were taken. The differential diagnoses were drug hypersensitivity syndrome and erythema multiforme. These were ruled out based on history and clinical examination. Routine blood investigations were done, and they showed low haemoglobin levels and lymphopenia. CRP and ESR were found to be within normal limits, and blood culture found no growth. However, a skin biopsy was not done. After a detailed history and clinical examination, a diagnosis of Stevens-Johnson Syndrome was made. All the previous medications were stopped, and he was started on IV Dexamethasone and IV Inj Pheniramine. The patient was kept under strict isolation to prevent infections. Serum electrolytes showed hyponatremia. IV fluids were started, and the correction of sodium was initiated. Dressings with topical steroids were done in the areas with erythematous lesions. Ophthalmologist's opinion was taken to rule out any ophthalmological complications. During the hospital stay, the patient was disoriented until the correction of hyponatremia. The patient gradually improved, and the lesions started healing. The steroid was gradually tapered and stopped over seven days. He was gradually started on liquid Sodium valproate and fluoxetine in view of significant depressive symptoms. The patient improved and was discharged.

Figure 3: Healed lesions during the discharge days

DISCUSSION

We suspect the cause of SJS to be due to the adverse effect of Lamotrigine/ rapid hiking of dose in our patient. Besides, our patient was on sodium valproate, which enhances the risk of SJS. In this case, the patient had taken an unknown medication two days before the onset of rashes. Many drugs can cause SJS, including oxicam-NSAIDs.[3] The patient had consulted a local doctor for shoulder pain and could have taken NSAID for the same, which could have added to the precipitation of this adverse reaction.

After the FDA approved lamotrigine for the treatment of bipolar depression, it is widely used for the treatment for the same. Clinical trials have found the incidence of rash in adults receiving lamotrigine as monotherapy to be 0.08% and 0.13% in adults receiving the drug as adjunctive therapy. It is commonly found that the risk of developing a rash increased when valproic acid is co-administered.[8] This patient was also on sodium valproate, which is known to decrease the clearance of lamotrigine even at low doses. This leads to an increase in serum concentration of lamotrigine which in turn increases the risk of SJS.[9] Therefore, during concomitant administration of these drugs, lamotrigine is hiked at half the usual regimen. Most cases of SJS occurred between five days and eight weeks of administration of lamotrigine.[7] Our patient developed rashes after four weeks of administration.

Once the patient is diagnosed with SJS, the offending drug has to be stopped immediately. Providing supportive care is the most important measure. Fluid, electrolyte and temperature monitoring has to be done. Ophthalmology consultation has to be obtained to reduce long term sequelae. Analgesia has to be provided. Wet dressings with topical corticosteroids to be considered for erythematous areas. Antibiotics should be considered only if infection occurs. In severe cases, intravenous immunoglobulin (IVIG) must be administered. The use of intravenous steroids is controversial.[1]

With certain precautions, severe rash associated with lamotrigine can be prevented. The most important preventive measures are appropriate dosing and dosage adjustment of the drug,[8]unlike the case presented by Kocak et al., where the patient was on valproic acid, carbamazepine and initiated a high dose of

lamotrigine.[10] This emphasizes that by following the dosing regimen, the risk of serious rash may be diminished but not eliminated. Patient psychoeducation is also important for preventing morbidity and mortality associated with serious adverse drug reaction development.[8] Our patient recovered well due to early intervention and immediate discontinuation of lamotrigine.

CONCLUSION

Despite following an appropriate dosing regimen, SJS is an important adverse drug reaction associated with the use of lamotrigine. Hence, all patients should be monitored for the possible systemic and cutaneous adverse effect during its administration. Immediate discontinuation of the drug, monitoring for adverse effects and drug interactions and early medical intervention is important to prevent high morbidity and mortality associated with lamotrigine.

REFERENCES

1. Pereira FA, Mudgil AV, Rosmarin DM. Toxic epidermal necrolysis. J Am Acad Dermatol. 2007 Feb;56(2):181–200.
2. Mockenhaupt M, Viboud C, Dunant A, Naldi L, Halevy S, Bouwes Bavinck JN, et al. Stevens-Johnson syndrome and toxic epidermal necrolysis: assessment of medication risks with emphasis on recently marketed drugs. The EuroSCAR-study. J Invest Dermatol. 2008 Jan;128(1):35–44.
3. Sassolas B, Haddad C, Mockenhaupt M, Dunant A, Liss Y, Bork K, et al. ALDEN, an algorithm for assessment of drug causality in Stevens-Johnson Syndrome and toxic epidermal necrolysis: comparison with case-control analysis. Clin Pharmacol Ther. 2010 Jul;88(1):60–8.
4. Werz MA. Pharmacotherapeutics of epilepsy: use of lamotrigine and expectations for lamotrigine extended release. Ther Clin Risk Manag. 2008 Oct;4(5):1035–46.
5. Peck AW. Clinical pharmacology of lamotrigine. Epilepsia. 1991;32 Suppl 2:S9-12.
6. Messenheimer JA. Lamotrigine. Epilepsia. 1995;36 Suppl 2:S87-94.
7. Calabrese JR, Sullivan JR, Bowden CL, Suppes T, Goldberg JF, Sachs GS, et al. Rash in multicenter trials of lamotrigine in mood disorders: clinical relevance and management. J Clin Psychiatry. 2002 Nov;63(11):1012–9.
8. Hilas O, Charneski L. Lamotrigine-induced Stevens-Johnson syndrome. Am J Health Syst Pharm. 2007 Feb 1;64(3):273–5.
9. Kanner AM. When Thinking of Lamotrigine and Valproic Acid, Think "Pharmacokinetically"! Epilepsy Curr [Internet]. 2004 Sep 1 [cited 2021 Jan 11];4(5):206–7.
10. Kocak S, Girisgin SA, Gul M, Cander B, Kaya H, Kaya E. Stevens-Johnson syndrome due to concomitant use of lamotrigine and valproic acid. Am J Clin Dermatol. 2007;8(2):107–11.

Case Report

SUBCORTICAL BAND HETEROTOPIA AND PACHYGYRIA WITH COGNITIVE DETERIORATION IN AN ELDERLY PATIENT

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ABSTRACT

Subcortical band heterotopia and pachygyria are rare conditions characterized by ectopic neuronal migration, leading to the appearance of "continuous double cortex appearance" and loss of normal convolutions of the cortex, respectively on neuroimaging. They usually present in childhood with disorders of muscle tone, craniofacial dysmorphism, refractory seizures, intellectual disability and feeding disturbances. Patients with such presentations have lowered life expectancy, but many mild cases survive till adulthood. Here we report subcortical band heterotopia and pachygyria – an incidental finding – in the case of an elderly lady with intellectual disability and seizure disorder, who presented with recent onset of cognitive decline and behavioural symptoms.

Keywords: Subcortical band heterotopia, pachygyria, seizure disorder, intellectual disability, cognitive decline

INTRODUCTION

Disorders of cortical formation are characterized by abnormal cortical structure occurring due to interruption in normal development during the stages of proliferation, migration or organization of the cortex. Ectopic neuronal migration leads to heterotopia and pachygyria.[1] Pachygyria refers to the thickening of the convolutions in cerebral hemispheres, with few gyri. Clinically, they present with intellectual disability, seizures, craniofacial dysmorphisms and often have reduced life expectancy.[2] Here, we present a case of an elderly female with pachygyria and heterotopia who presented with intellectual disability, seizure disorder and recent onset of cognitive deterioration.

CASE REPORT

Miss P, a 63-year-old, unmarried, illiterate woman with intellectual disability and seizure disorder, presented with recent worsening of her cognitive functions and behavioural problems. As a child, she had poor social skills and difficulty in learning new skills; but used to maintain self-care without supervision and help in various household chores. From her childhood, she had recurrent attacks of generalized tonic-clonic seizures. She was on Tab. Carbamazepine from the age of 30 years, which was continued irregularly, and she used to get one or two seizure per month. There were no pervasive mood symptoms, suspicions, fearfulness, hallucinatory behaviour or other behavioural problems.

Over the past 1½ years, she had sleep impairment and inability to do the usual chores. There was a history suggestive of agnosia—she was unable to identify objects which she used to do earlier. This led to impairment in her functioning; she could not help in the chores she used to earlier. There were no behavioural issues at that time. Five months back, there was a sudden onset of behavioural symptoms characterized by impaired vegetative and social functioning. She had fatigue, showed odd movements but had no drowsiness,

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confusion, misidentification of relatives, picking movements or agitation. For this, she was treated at a local hospital, identified to have hyponatremia and managed with IV fluids. After this, her sleep and appetite improved, but cognitive dysfunction persisted.

One month back, she developed decreased sleep, poor social interaction and communication and was refusing feeds. She was treated elsewhere, had some improvement, then medications were stopped. Two weeks later, she had worsening of her symptoms and difficulty in walking. She had a seizure one week later, following which she was brought to our institution for further management. On examination, she was fully conscious but agitated, irritable, aggressive and not cooperative for detailed examination. Physical examination revealed bilateral hypertonia, hyperreflexia and bilateral flexor plantar reflex. Laboratory investigations were normal (See Table 1).

Table 1. Blood investigation results of the patient

investigations	values
Total WBC count	5200 Cells/cu.mm
Hemoglobin	12.7 g/dl
Platelet count	6,05,000/cu.mm
Random blood sugar	95mg%
Blood Urea	13 mg%
Serum Creatinine	0.7 mg %
Serum Sodium	140 mmol/L
Serum Potassium	3.2 mmol/L
Serum Magnesium	1.8 mg/dl
Serum Calcium	8.4 mg %
Serum Phosphorus	3.1 mg %
Serum TSH	0.77 microIU/ml
Serum T3	3.23 pg/ml
Serum T4	0.89 ng/dl

CT Scan Brain showed pachygyria, malfolded sylvian fissure, subcortical band heterotopia (SBH) and deep white matter ischemia (See Figures 1 and 2). Considering her poor financial background, MRI Brain was deferred as it would not have contributed to the patient's diagnosis or management.

She was managed with parenteral Haloperidol initially and then Tab. Quetiapine, the dose of which was titrated slowly. Tab. Carbamazepine 200 mg HS was continued as per the advice of the Neurologist. Supportive care was given. Adequate nutrition and hydration were ensured by Ryle's tube feeds and multivitamin tablets. Gradually her irritability and aggressive behaviour reduced, and she began taking oral feeds. But her communication was poor. She

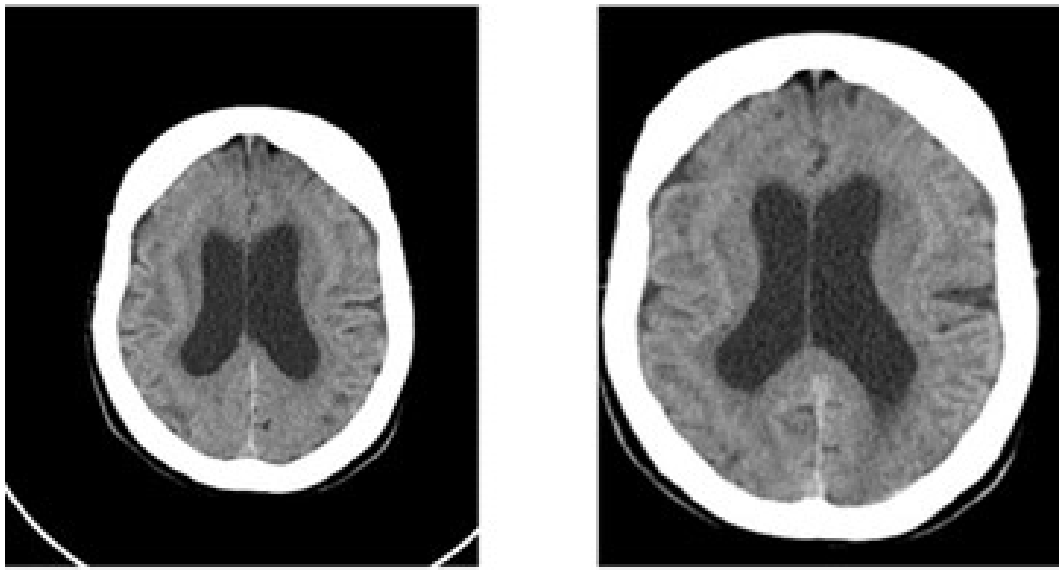

Figure 1. CT Scan Brain showing pachygyria and subcortical band heterotopia

Figure 2. CT Scan Brain showing malfolded sylvian fissures and deep white matter ischemic changes

conscious and alert but was not cooperative for a detailed cognitive examination. She was mostly bedridden and had urinary incontinence. Her everyday activities were completely supervised. She was discharged after two weeks of inpatient care on Tab. Carbamazepine 200 mg HS, Tab. Quetiapine 25 mg 1-0-1½ with ½ SOS if agitated and multivitamin tablets. After one week, the patient was taking oral feeds, her sleep improved, and she was manageable at home.

Considering the past history, recent worsening of cognitive functions over the past eighteen months and impairment in activities of daily living, with an acute deterioration five months back along with behavioural disturbances, clinical diagnoses of Moderate Intellectual Disability, Seizure disorder and Major Neurocognitive Disorder (MNCD) due to vascular cause, with behavioural disturbances, were made.

DISCUSSION

SBH and pachygyria are generally associated with low life expectancy. Cases of psychosis, schizo-affective disorder, mania and seizures associated with neuronal migration disorder have been reported.[3,4] Here, we report a case that presented with seizure disorder and intellectual disability who survived to old age and developed further cognitive deterioration, impairment in functioning and behavioural disturbances suggestive of MNCD, possibly due to vascular cause, in an elderly female.

Among the disorders of cortical formation, lissencephaly—including agyria and pachygyria—and SBH belong to a single malformation spectrum. There is an arrest of neuronal migration in both these conditions. SBH is a smooth layer of grey matter seen subcortically, separated from the overlying cortex's curvature by a thin band of white matter, giving it a characteristic appearance of "continuous double cortex." Usually, the cortex is normal or pachygyric (with few gyri) in these cases.[1] Although mutations of *LIS1* and *DCX* genes were initially implicated in the aetiology, with advancements in molecular genetics, almost 19 LIS-associated genes have been identified.[5] DCX gene mutations cause lissencephaly in males and SBH in females. Classical lissencephaly manifests with epilepsy and psychomotor retardation, while SBH presents with a milder course, with mild to moderate intellectual disability and late-onset epilepsy usually.[6] This patient had presented with a history suggestive of mild to moderate intellectual disability and seizure disorder. Due to the milder form of presentation, she could survive to old age, when she developed further deterioration of cognitive function and behavioural disturbances.

In a review of clinical, imaging and molecular data, 188 cases with lissencephaly and SBH, aged one day to 40 years, were studied. The case we present is aged 63 years—the oldest reported as per review of literature. Generally, such patients present with mild to moderate clinical severity—borderline to moderate intellectual disability and seizures of variable severity, often poorly controlled. Although life expectancy is reduced, many of these patients survive to adulthood.[5] This patient survived to old age and developed significant cognitive impairment, including agnosia and impairment in language function, associated with impairment in everyday activities and behavioural disturbances. CT Scan of the brain revealed white matter ischemic changes along with pachygyria and SBH. National Institute of Neurological Disorders and Stroke and the Association Internationale pour la Recherche et l'Enseignement en Neurosciences (NINDS-AIREN) criteria states that a diagnosis of possible vascular dementia can be made even in the absence of a clear

temporal relationship between dementia and stroke or in patients with a subtle onset and variable course of cognitive deficits and evidence of cerebrovascular disease.[7] In this patient, the abrupt onset of behavioural symptoms, gait difficulty and worsening of cognitive symptoms could be due to vascular insults as evidenced by the deep white matter ischemic changes. Hence, a clinical diagnosis of MNCD due to vascular causes was made along with intellectual disability. The history, physical examination and investigations were not suggestive of any other causes of dementia.

CONCLUSION

Detection of pachygyria and SBH was an incidental finding in this patient, who presented with a history of intellectual disability and seizure disorder. The genetic mutation was not probably severe enough, so that she could survive to old age and present with further cognitive impairment due to vascular causes. This is the oldest case of pachygyria and SBH that has been reported to the best of our knowledge.

REFERENCES

1. Razek AAKA, Kandell AY, Elsorogy LG, Elmongy A, Basett AA. Disorders of cortical formation: MR imaging features. Am J Neuroradiol 2009,30:4-11.
2. Badrinath AK, Suresh K, Raghunathan R, Balachandran M, Suresh Babu S. A case of seizure disorder—pachygyria a rare presentation. International Journal of Contemporary Medical Research 2016;3(11):3243-44.
3. Chatterjee SS, Talapatra D, Acharya R, Sarkhel S. Pachygyria presented as mania. Indian J Psychol Med 2015;37:452-5.
4. Modabbernia A, Modabbernia MJ, Alizadeh H, Ashrafi M. Mania and pachygyria. J Neuropsychiatry Clin Neurosci 2011;22:3
5. Di Donato N, Chiari S, Mirzaa GM, Aldinger K, Parrini E, Olds C, et al. Lissencephaly: Expanded imaging and classification. Am J Med Genet 2017;173(6)1473-88.
6. Jain P, Dhingra D, Kumar A, Sharma S, Chandra J, Aneja S. Lissencephaly with subcortical band heterotopia in an Indian family. Indian J Pediatr 2014;81(8):844-5.
7. Erkinjuntti T. Clinical criteria for vascular dementia: The NINDS-AIREN criteria. Dementia 1994;5:189-92.

Case Report

A CASE REPORT OF MANIC EPISODE FOLLOWING SARS-CoV-2 INFECTION

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ABSTRACT

The novel coronavirus infection has been associated with various neuropsychiatric sequelae, including manic episodes, but only a few cases have been described in the literature. Here we present a case of a manic episode in an individual following COVID-19 infection, probably linked to the virus. This case report highlights the need to identify and assess various neuropsychiatric manifestations of COVID-19 and the need for further research on its manifestations, biological mechanisms, and long-term sequelae.

Keywords: COVID-19, manic episode, SARS CoV-2, EEG

INTRODUCTION

The emergence and global spread of the novel coronavirus (COVID-19) have imposed a significant mental health burden across the whole world.[1] Evidence suggests that severe acute respiratory syndrome coronavirus- 2 (SARS-CoV-2) may be associated with neuropsychiatric disorders.[1] Emerging neuropsychiatric sequelae of COVID-19 include encephalopathy, anxiety, depression, mania, and trauma-related disorders.[2] Much is yet to be known about the possible biological mechanism, presentation and long term sequelae of manic episode induced by COVID-19 infection.

CASE REPORT

Mr K, aged 53, is a driver by profession in the government sector. He is married and belonged to middle-class background. He was apparently well adjusted. He came to the outpatient department of the medical college unit at the mental health centre, Thiruvananthapuram, for consultation in January 2021.

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His symptoms started nearly two weeks before, as a bilateral occipito-parietal headache, which was of moderate to severe intensity and lasted throughout the day. Then he developed sore throat, fever, and generalized body ache. By the third day of onset of symptoms, he consulted a local hospital and was tested for COVID-19. The result came positive, and he was admitted to a COVID-19 First line Treatment Centre (CFLTC) in the city. On the second day of admission, he noticed having anosmia. He shared the room with another patient, and no behavioural problems were reported during the admission period. He was treated initially with paracetamol, pantoprazole, vitamin B complex tablets, and due to his persistent upper respiratory symptoms, azithromycin 500 mg once daily was added on the 5th day of admission.

On the 8th day post-admission, the patient with whom he was sharing room, noticed him having poor sleep, pacing around at night, expressing suspiciousness, talking excessively over the telephone, and informed Mr

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K's relatives about the same. However, there were no pervasive mood changes then. On the 10th day after admission, COVID rapid antigen test turned negative. He was discharged and sent home. At home, the behavioural problems worsened in the form of increased talk, reduced sleep, abnormally elevated self-esteem. The wife noticed him cleaning and arranging the room multiple times, even at odd hours, and burning his old clothes.

He was talking excessively and could not be interrupted by others. He became increasingly irritable and lashed out over trivial issues, which was quite unlike his nature. In view of these behavioural disturbances, he was brought to the outpatient department of the medical college unit at the mental health centre Thiruvananthapuram after two days at home.

There was no history of any significant medical illness or psychiatric disorder. There was no history of substance dependence. However, there was a history of behavioural symptoms as episodes of pervasive irritability, reduced sleep, increased talk suggestive of bipolar disorder in brother. At present, he is well maintained. However, details of medications are not available.

In the outpatient department, mental status examination revealed a conscious, well-oriented person with increased psychomotor activity and talk. His mood was euphoric. Flight of ideas was present. Grandiose ideas were also expressed. Neurological examination and other system examinations were within normal limits. He was admitted. The Young Mania Rating Scale (YMRS) was introduced for evaluation. Serial mental status examinations on the following days revealed similar features suggestive of a manic episode. No features of delirium were observed. He was started on risperidone 2 mg per orally initially; two days later, carbamazepine 200 mg was also added. Carbamazepine was hiked to a dose of 300 mg on the next day and 400 mg on the day after. A consultation was sent to the department of neuro medicine of the medical college. The mood symptoms of the patient improved over the next few days. However, he was referred for inpatient evaluation as per opinion from the neuro medicine department. The patient's YMRS score decreased gradually, from 36 on the 1st day of admission to 10 on the 7th day when he was referred.

Blood investigations showed normal blood counts, lactate dehydrogenase (LDH) was slightly elevated. However, D-dimer, X-ray, CT brain, ECG were within normal limits.

EEG study revealed epileptiform discharges from the left temporal region, after which probability of Herpes (HSV) encephalitis was considered, and injection acyclovir was started empirically, at a dose of 500mg iv q8 hourly. MRI brain showed only small vessel ischemic changes. Following admission in neuro medicine, lumbar puncture was performed, CSF study was within normal limits. The viral panel was negative for HSV. By the 3rd day of admission in neuro medicine, his mood was euthymic, and he was no longer expressing grandiose ideas. Sleep also showed improvement, and he was discharged on the 7hday. The patient was advised to continue acyclovir intravenously from the local hospital for one week more. It was followed by oral acyclovir at a dose of 3200 mg/day in four divided doses. The patient was later followed up one week after discharge at Psychiatry OPD and maintained well on tab carbamazepine 400 mg and risperidone 2 mg. He was reviewed again after two weeks, and then he was adherant on medications and had started going to work. The patient provided informed consent for publication of the case details.

DISCUSSION

The described features are indicative of a manic episode. But in view of the lack of previous mood episodes,late age of onset, the temporal correlation with the viral infection, lack of history of substance use, a short course of the illness and the associated EEG changes, we suspect that this manic episode could probably be a neuropsychiatric manifestation of SARS CoV-2, thus considering the diagnosis of bipolar disorder due to SARS CoV-2 infection with manic features, as per DSM 5. The family history of bipolar disorder in his brother suggests a probable genetic vulnerability in this patient and might be a contributory factor.

The treatment for COVID had included azithromycin as part of the treatment regimen. Though cases of 'antibiomania' have been described with clarithromycin (another member of the macrolide group antibiotics) [3], instances of manic episodes with azithromycin are not well described in the literature.

The temporal epileptiform discharges and the clinical picture raised suspicion of HSV encephalitis, but the viral panel for HSV was negative. Interestingly, a recent metanalysis has found that epileptiform discharges are common in COVID 19 though instances of seizures were rare.[4] MRI brain revealed small vessel changes. The patient does not have any history suggestive of hypertension, diabetes, or smoking. Neuroimaging studies have yielded cerebral vascular changes in patients with late onset bipolar disorder. Though non-specific, small vessel changes had also been described associated with COVID 19 in the literature.[5]

Neurotropism of the SARS CoV 2 virus has been well described in the literature. Neuropsychiatric manifestations have been well documented in COVID.[6] The entry of SARS-CoV-2 into human host cells is mediated mainly using angiotensin converting enzyme-2 (ACE-2) as a receptor. Interestingly, in addition to the lungs and gastrointestinal tract, the ACE-2 is also expressed in the endothelial cells of brain vasculature, a possible route of entry of the virus into the brain.[7,8] The cytokine storm, which is considered a hallmark of the SARS CoV-2 infection, might lead to neuroinflammation and impaired monoaminergic transmission[9], possibly contributing to the pathogenesis of psychiatric disorders. A possible mechanism may involve immune system activation and its effect on the CNS. Infection associated immune activation and release of inflammatory mediators is considered a possible etiologic factor behind bipolar disorder.[10]

As per the available information, the possibility of primary bipolar disorder cannot be completely ruled out. Hence the patient would be kept on constant follow-up, and the further emergence of a mood episode in future will be identified.

REFERENCES

1. Zubair AS, McAlpine LS, Gardin T, Farhadian S, Kuruvilla DE, Spudich S. Neuropathogenesis and neurologic manifestations of the coronaviruses in the age of coronavirus disease 2019: a review. JAMA Neurology. 2020 Aug 1;77(8):1018-27.
2. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. Lancet Psychiatr. 2020;7:611–627. doi: 10.1016/S2215-0366(20)30203-0.
3. Ortiz A, Berlanga C, Gutierrez DMA case of clarithromycin-induced manic episode (antibiomania). International Journal of Neuropsychopharmacology (2004);7:99–100.
4. Kubota T, Gajera PK, Kuroda N. Meta-analysis of EEG findings in patients with COVID-19. Epilepsy Behav. 2021 02;115:107682.
5. Choi Y, Lee MK. Neuroimaging findings of brain MRI and CT in patients with COVID-19: A systematic review and meta-analysis. Eur J Radiol. 2020 Dec; 133:109393.
6. Troyer EA, Kohn JN, Hong S. Are we facing a crashing wave of neuropsychiatric sequelae of COVID-19? Neuropsychiatric symptoms and potential immunologic mechanisms. Brain Behav Immun. 2020 Jul 1; 87:34–9.
7. Baig AM, Khaleeq A, Ali U, Syeda H. Evidence of the COVID-19 virus targeting the CNS: tissue distribution, host–virus interaction, and proposed neurotropic mechanisms. ACS chemical neuroscience. 2020 Mar 13;11(7):995-8.
8. Hamming I, Timens W, Bulthuis ML, Lely AT, Navis G, van Goor H. Tissue distribution of ACE2 protein, the functional receptor for SARS coronavirus. A first step in understanding SARS pathogenesis. J Pathol. 2004 Jun;203(2):631-7. doi: 10.1002/path.1570. PMID: 15141377; PMCID: PMC7167720.
9. Jansen van Vuren E, Steyn SF, Brink CB, Möller M, Viljoen FP, Harvey BH. The neuropsychiatric manifestations of COVID-19: Interactions with psychiatric illness and pharmacological treatment. Biomed Pharmacother. 2021 Mar;135:111200.
10. Benros ME, Waltoft BL, Nordentoft M, Østergaard SD, Eaton WW, Krogh J, et al. Autoimmune diseases and severe infections as risk factors for mood disorders: a nationwide study. JAMA Psychiatry. 2013 Aug 1;70(8):812-20.

Case Report

DARIER'S DISEASE AND SCHIZOPHRENIA- A CASE REPORT

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ABSTRACT

Darier's disease is a rare autosomal dominant genodermatosis. There is a specific mutation in the ATP2A2 gene on chromosome 12q. Several neuropsychiatric manifestations have been described in association with Darier's disease. Most reports have come from western populations, with limited reports of Darier's disease and its neuropsychiatric associations among Asian people, although the demographic and clinical profiles are comparable. We present a case of 38 year old female from Kerala with Darier's disease presenting with schizophrenia spectrum disorder. Her first degree relatives have schizophrenia-like psychosis and dermatological manifestations suggestive of Darier's disease.

Keywords: Darier's disease, schizophrenia

INTRODUCTION

Darier's disease (also known as keratosis follicularis or dyskeratosis follicularis) is a rare autosomal dominant disorder. Darier's disease occurs worldwide, with an estimated incidence of 4 per million per decade and prevalence ranging from 1 in 30,000[1] to 1 in 100,000.[2] Men and women are affected equally. The age of onset is typically in the second decade of life. Clinically, Darier's disease is characterised by small, isolated papules that usually appear in childhood or teenage (10-20 years of age). These progressively enlarge and extend and are soon followed by thick and adherent grey-yellowish scales with a typical symmetric pattern. The sites of predilection are seborrhoeic areas, folds, and the face (scalp margins, forehead, ears, nasolabial furrows, and scalp). Nails and mucous membranes can be involved, too (particularly buccal mucosa, pharyngeal walls, oesophagus, and rectum). In addition, palms and soles are frequently involved, with typical small lesions of keratosis punctata or pits.[3] Darier's disease is a chronic problem with many relapses during the summer season and variable pruritus, especially localised in folds or areas subject to repeated trauma. Fetid odour occurs mainly when skin folds are affected.

There is a specific mutation in the ATP2A2 gene on chromosome 12q. The ATP2A2 gene encodes the sarcoplasmic/endoplasmic reticulum calcium–adenosine triphosphatase isoform 2 protein (SERCA2), a calcium pump with a central role in intracellular calcium signalling.[4] Family members with confirmed identical *ATP2A2* mutations can exhibit differences in the clinical severity of disease, suggesting that other genes or environmental factors affect its expression.[5] Although expressivity is variable, penetrance is high at 95%.[6]

Several neuropsychiatric conditions have been described in association with Darier's disease. However, these don't appear to be associated with a specific class of mutation and may result from an intrinsic but inconsistent effect of defective ATP2A2 expression. Descriptions of neuropsychiatric manifestations such as intellectual disability[2,7,8], epilepsy[3], mood disorders [9,10], suicide [2,11], psychosis [7,12,] and schizophrenia [13] have been

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reported in patients with Darier's disease. But a comprehensive epidemiological data regarding neuropsychiatric manifestations are lacking. Reports of the association between Darier's disease and neuropsychiatric disorders have mostly come from western populations. We report the case of a 38-year-old woman with Darier's disease- hypertrophic form presenting with schizophrenia spectrum disorder.

CASE REPORT

A 38-year-old female patient from Kollam presented to us in April 2021 with four years of behavioural problems. She was educated up to plus one, married but separated from her husband, has three children, and worked in a cashew factory until three months back. She was diagnosed with Darier's disease, with initial skin manifestation at around 15year of age and no prior history of any psychiatric illness. However, she has a family history of epilepsy in her sister, schizophrenia-like psychiatric illness in her father and brother, and dermatological manifestations suggestive of Darier's in her father and daughter. Father had illness onset at 55 years of age and her brother at 20 years. Father passed away, and her brother is 37 years old and is continuing medication. Her daughter, who is currently 14 years old, has dermatological manifestations for the last 7- 8 years.


Fig 1- Hyperkeratotic papular lesions with scaling over face, neck and anterior chest wall


Fig 2- Hyperkeratotic papular leisions over hand and

As per her aunt, the informant, she has a continuous illness of four years, with insidious onset, characterised by decreased social interaction, suspiciousness that her food is being poisoned, decreased self-care, sleep, and food intake, and muttering and smiling to self. She had psychiatric consultation locally at Kollam, had temporary improvement, but was on irregular medications (medication details not available). However, she was totally off medications for the past four months and had a worsening of her symptoms, hence bringing for admission.

On mental status examination, she was alert, oriented to time, place, and person; rapport could be established. The psychomotor activity was normal., There was prolixity. There were multiple non-systematised, non-bizarre, and bizarre delusions of persecution, grandeur, infidelity, and delusion of being pregnant by God. She had an anxious mood, affect was appropriate, reactive, of full-range, and mobile. She had second and third-person auditory hallucinations. Cognitive functions were intact, except impaired social, personal, and test judgement and grade 1 insight. Physical examination showed hyperkeratotic, hyperpigmented papular lesions over the face, neck, trunk, and upper and lower limbs, with pruritus. The nails and mucosa were spared.

Based on history and serial mental status examination and observation of ward behaviour, a psychiatric diagnosis of schizophrenia was made, with a differential diagnosis of schizoaffective disorder. Routine investigations, including CBC, biochemistry, thyroid

function test, etc., were done and were within normal range. She was started on risperidone 2mg, which was increased gradually and optimised at 6 mg during the one month of admission. Symptomatic treatment was given for the pruritus. Dermatology consultation was deferred due to the Covid situation. She showed significant improvement in psychopathology and her insight also improved by the time of discharge.

Informed consent was taken from the patient before taking the photographs.

DISCUSSION

There are reports in the literature about the association of Darier's disease with increased psychiatric morbidity, such as depression, suicidal ideation, and mood disorders. However, the most commonly observed neuropsychiatric manifestation in them was major depression. Few case reports highlight the occurrence of schizophrenia in Dariers disease. One of the arguments for the association between Darier's disease and neuropsychiatric disorders is the observation that the skin and brain share a common ectodermal origin. Four possible interpretations for this association are - the association may be purely chance, with no true biological basis (chance hypothesis), the psychiatric disorder could have been triggered by an understandable psychological reaction to the presence of chronic disfiguring skin disease and is unrelated to biological susceptibility (reactive hypothesis), the Darier mutation, through pleiotropic effect, could have increased vulnerability to neuropsychiatric illnesses (pleiotropy hypothesis)[14] or there could be a genetic linkage between the Darier gene and a separate susceptibility gene for neuropsychiatric manifestation (linkage hypothesis).[15] The Darier's disease locus was identified as the ATP2A2, which codes for sarcoplasmic/endoplasmic reticulum calcium-ATPase, SERCA2.[16] This gene presents potential susceptibility to neuropsychiatric manifestation under the hypothesis that variations in SERCA2 have pleiotropic effects in the brain.

In this case, Darier's disease presents with schizophrenia; her first degree relatives have schizophrenia-like psychosis and dermatological manifestations suggestive of Darier's disease. Most of the reported cases in the literature are from the Western world. It was reported that the demographic and clinical profiles of Asian patients with Darier's disease were comparable to that of the western population in terms of incidence rate, age of onset, distribution of disease patterns, and association with neuropsychiatric disorders[(17)]. The rarity of the case was the reason for us to present this case report.

REFERENCES

1. Tavadia S, Mortimer E, Munro CS. Genetic epidemiology of Darier's disease: a population study in the west of Scotland. Br J Dermatol. 2002 Jan;146(1):107–9.
2. Svendsen IB, Albrectsen B. The prevalence of dyskeratosis follicularis (Darier's disease) in Denmark: an investigation of the heredity in 22 families. Acta Derm Venereol. 1959;39:256–69.
3. Burge SM, Wilkinson JD. Darier-White disease: a review of the clinical features in 163 patients. J Am Acad Dermatol. 1992 Jul;27(1):40–50.
4. Sakuntabhai A, Ruiz-Perez V, Carter S, Jacobsen N, Burge S, Monk S, et al. Mutations in ATP2A2, encoding a Ca2+ pump, cause Darier disease. Nat Genet. 1999 Mar;21(3):271–7.
5. Mutational analysis of the ATP2A2 gene in two Darier disease families with intrafamilial variability - Onozuka - 2004 - British Journal of Dermatology - Wiley Online Library [Internet]. [cited 2021 May 3]. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1111/j.0007-0963.2004.05868.x
6. Sehgal VN, Srivastava G. Darier's (Darier-White) disease/keratosis follicularis. Int J Dermatol. 2005 Mar;44(3):184–92.
7. Getzler NA, Flint A. Keratosis follicularis. A study of one family. Arch Dermatol. 1966 May;93(5):545–9.
8. Medansky RS. WOLOSHIN AA: Darier's disease. An evaluation of its neuropsychiatric component. Arch Dermatol. 1961 Sep;84:482–4.
9. Craddock NJ, Owen MJ, Burge S, Kurian B, Thomas P, McGuffin P. Familial cosegregation of major affective disorder and Darier's disease (keratosis follicularis). Br J Psychiatry. 1994 Mar;164(3):355–8.
10. Wang S-L, Yang S-F, Chen C-C, Tsai P-T, Chai C-Y. Darier's disease associated with bipolar affective disorder: a case report. Kaohsiung J Med Sci. 2002 Dec;18(12):622–6.
11. Denicoff KD, Lehman ZA, Rubinow DR, Schmidt PJ, Peck GL. Suicidal ideation in Darier's disease. J Am Acad Dermatol. 1990 Feb;22(2 Pt 1):196–8.
12. Hellwig B, Hesslinger B, Walden J. Darier's Disease and psychosis. Psychiatry Res. 1996 Oct 16;64(3):205–7.
13. O'Malley MP, Bassett AS, Honer WG, Kennedy JL, King N, Berg D. Linkage analysis between

schizophrenia and the Darier's disease region on 12q. Psychiatr Genet. 1996;6(4):187–90.
14. Jacobsen NJ, Lyons I, Hoogendoorn B, Burge S, Kwok PY, O'Donovan MC, et al. ATP2A2 mutations in Darier's disease and their relationship to neuropsychiatric phenotypes. Hum Mol Genet. 1999 Sep;8(9):1631–6.
15. Jones I, Jacobsen N, Green EK, Elvidge GP, Owen MJ, Craddock N. Evidence for familial cosegregation of major affective disorder and genetic markers flanking the gene for Darier's disease. Mol Psychiatry. 2002;7(4):424–7.
16. Godi A. Darier disease. A review of pathophysiological mechanisms. R E V E W. 2003;12(4):8.
17. Goh BK, Ang P, Goh CL. Darier's disease in Singapore. Br J Dermatol. 2005 Feb;152(2):284–8.

Column: Tips on Research and Publication

WRITING THE METHODS SECTION IN A MANUSCRIPT

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In the IMRAD format that is followed while writing scientific manuscripts, the methods section follows the introduction. In the introduction, the research gap is identified, and the objectives of the study are revealed. The methods section details how the study was carried out to achieve the stated objectives. It is the easiest section to finish, as it was already written while the research protocol was being prepared, provided enough attention was paid to the details in that stage. At the same time, the methods section should not be different from what was originally planned. As it is mandatory to register intervention studies in clinical trial registries prospectively, these details will already be available in the public domain, and it will be easy for the reviewers and editors to identify any deviations from the protocol. Hence, the researchers should update the trial registry with such changes and also justify them in the final research report.

How much to write under the methods?

Ideally, the methods should be written in sufficient detail so that someone else can reproduce the study after reading the section. This means all the details regarding the conduct of the study should be included. However, it may not always be practical to add all the details, especially because of the word limits imposed by the journals. So, a compromise is to write the details to such an extent that the research paper appears reliable. Sometimes, when the researcher has more than one manuscript from the same study, the methods section can be kept short, the first paper can be cited, and the readers can be suggested to look that up if they want more details.

The components that go into the methods are: a) study design, setting, duration (exact year); b) ethical considerations such as approval from the scientific and ethics committees (mention the name and unique numbers assigned), written informed consent from the participants, trial registration, and any other special permissions obtained (e.g., permission to translate or validate a rating scale); c) sampling, sample size calculation, eligibility criteria; d) methods of randomization, allocation concealment, blinding; e) assessment tools (e.g., rating scales, devices), scoring, properties (reliability, validity), interpretation; f) outcome measures (primary, secondary), confounders; g) description of interventions in all the groups (e.g., active and sham); h) statistical analysis (software, tests). However, to ensure blinded reviews, at the time of the initial submission, details such as the name and city of the institution, name of the ethics committee and the number assigned, etc., can be masked in the manuscript file. However, include such information on the title page or cover letter so that the editors are aware of the details.

Organization of the methods section

Use standard subheadings to organize this section (though some journals allow without subheadings). One widely used style is *participants, tools/measures, procedure, and statistical analysis*. However, other subheadings too can be used, depending on the research paper. A common error in submitted manuscripts is that

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this portion is not organized in a paragraph format and is rather presented using bullet points, with multiple subheadings and 'single-line paragraphs' (e.g., "study design: cross-sectional observational. Study setting: a tertiary care referral centre"). However, though such style may be suitable for a protocol, thesis, or PowerPoint slide, it is inappropriate for a journal article. Remember to organize the content into paragraphs using the standard subheadings.

Mention the study design early under the methods (if not already mentioned as part of the objectives), possibly in the first sentence itself. For example, "This was a cross-sectional, observational study carried out …" Avoid unclear expressions such as "retrospective/prospective study". The major study types are: qualitative or quantitative, experimental or observational, cohort, case-control, or cross-sectional (See https://doi.org/10.4103/IJPSYM.IJPSYM_66_19 for details on how to describe a study design). The operational definitions of key variables should be mentioned, with appropriate citations (For example, there are multiple definitions of "treatment-resistant depression.") Mention the confounders considered while planning the study and how they were managed (e.g., changes in sampling or eligibility criteria, planning additional assessments). However, avoid discussing confounders that were revealed as an afterthought from looking at the study results; they are better placed in the discussion section.

Under *participants*, describe the study sample, including the sampling frame, sampling procedure, sample size calculation, and eligibility criteria. Describe the sampling procedure, rather than just stating the sampling type (e.g., instead of "random sampling was used," write "simple random sampling was done using random number table"). Mention the method of recruitment (e.g., advertisements or social media posts). Similarly, sample size calculation too should be detailed (e.g., "Estimated sample based on 20% prevalence, 95% confidence interval, and 5% precision for the infinite sample was 246"). Post hoc sample size and power calculations are not helpful and are better avoided. Mention the eligibility criteria clearly. Avoid overlap of content between inclusion and exclusion criteria (e.g., if "age range 18-60 years" is mentioned as inclusion criteria, do not mention "less than 18 years and more than 60 years" under the exclusion criteria). Don't mention "those who refused to consent" as exclusion criteria. Give details of the control subjects too, and if matching was done, how it was done (e.g., it is not sufficient to say just "age, education, and sex-matched controls"). Mention the ethics committee that approved the study. Manuscripts without ethics approval will usually be desk rejected. A statement confirming that the study followed the guidelines from the Declaration of Helsinki may be added here, though not mandatory. State explicitly whether written informed consent (along with assent in minors) was obtained from the participants. Add trial registry information here. Check the journal's author guidelines for information on whether the trial registry registration number should be revealed in the manuscript file or not.

Tools section includes all rating scales and questionnaires, with details such as the version, items, scoring, modifications or adaptations, translations, information on reliability and validity, and interpretation of scores. It is not sufficient to describe the psychometric properties of the original scale; reliability and validity measures in the Indian population will be more helpful. Do not elaborate on common rating scales (e.g., Hamilton Depression Rating Scale or HAM-D). However, mention which version of the scale was used (e.g., "11-item version of HAM-D"). Specify, with references, if more than one version is available for the same scale (e.g., Structured Interview Guide for HAM-D or SIGH-D rather than HAM-D, if the structured interview version was used). Mention whether it is self- or clinician-administered, and the scoring criteria and interpretation, especially for less frequently used scales. If more than one rater administered the scales, mention interrater reliability if available. Mention, with appropriate citation, the cut-off scores for defining categories (e.g., caseness or severity level such as mild, moderate, or severe), as different investigators may have used different cut-offs. If any device is used, mention the make and specifications (e.g., Soterix 1×1 tDCS instrument, Soterix Medical Inc., New York).

The *procedure* section details how the sample was selected, how and when the assessments were done, who conducted the assessments, and if relevant, what intervention was done. Interventions should be described in detail (specifically if it is new), including active or placebo arms, drug, dose, and route. (e.g.,

"The dose of medications was flexible and was titrated based on tolerability up to X mg/d in two divided doses. The control group received similar-looking placebo tablets twice daily.") If relevant, the method of randomization and allocation concealment should be clearly mentioned (e.g., "Randomization was done using a random-number table. Allocation concealment was done using an opaque, sealed envelope"). Information on who was blinded and how the blinding was achieved is more beneficial to the readers than just mentioning single- or double-blind.

If the journal follows blinded peer review, don't include the abbreviations of author names (e.g., "SA did the randomization while SKP applied the rating scales"). Instead, say "first author", "second author", etc., or mask them during initial submission ("X did the randomization while Y applied the rating scales").

Be specific while describing *statistical analyses*. Mention the statistical software used and its version (beware of the pirated versions of the software). Mention whether data normality was examined, and if so, how (e.g., "Data normality was examined using Shapiro-Wilk test and histograms"). State if any data transformation was done prior to the analysis. Mention the tests used and for which variables (e.g., "Independent sample t-test was used to compare the means of X"). Mention which effect size measure was used and what cut-off was used to interpret (e.g., small, medium, and large). Add references for any unusual statistical procedures – here, cite standard journals or textbooks only. Exploratory analyses done, if any, should be clearly spelt out.

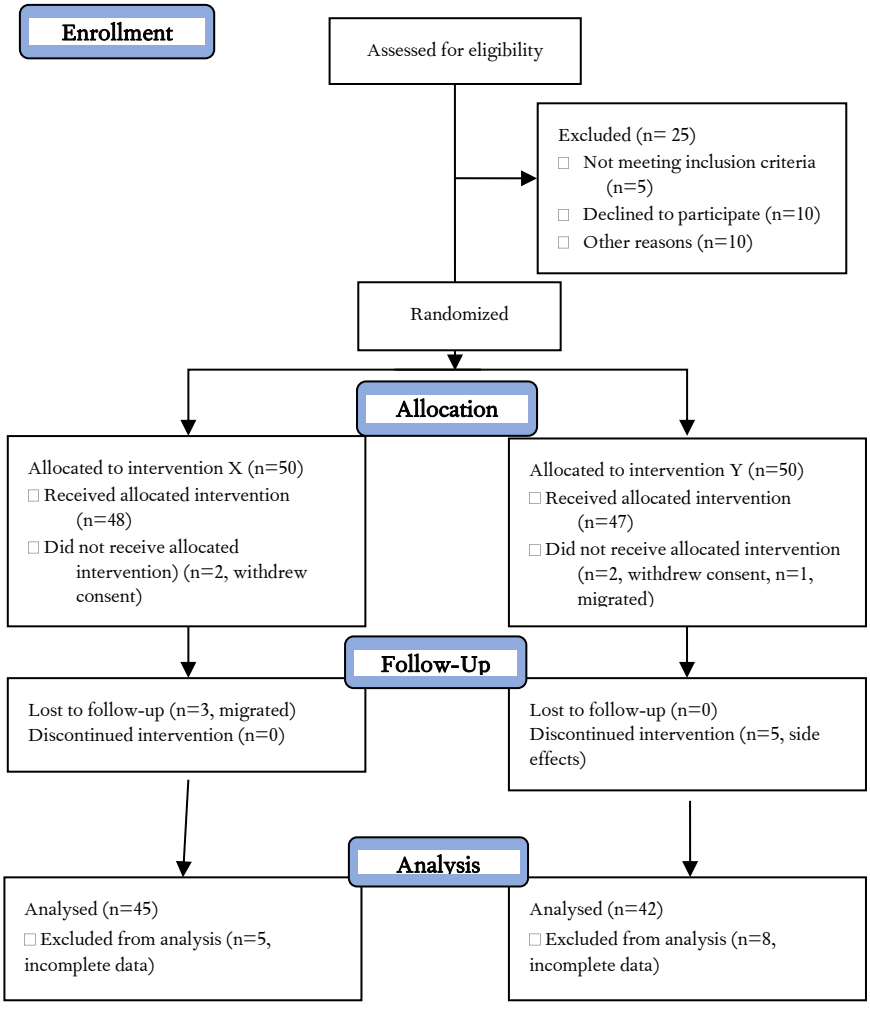

Fig 1: CONSORT diagram showing the flow of participants

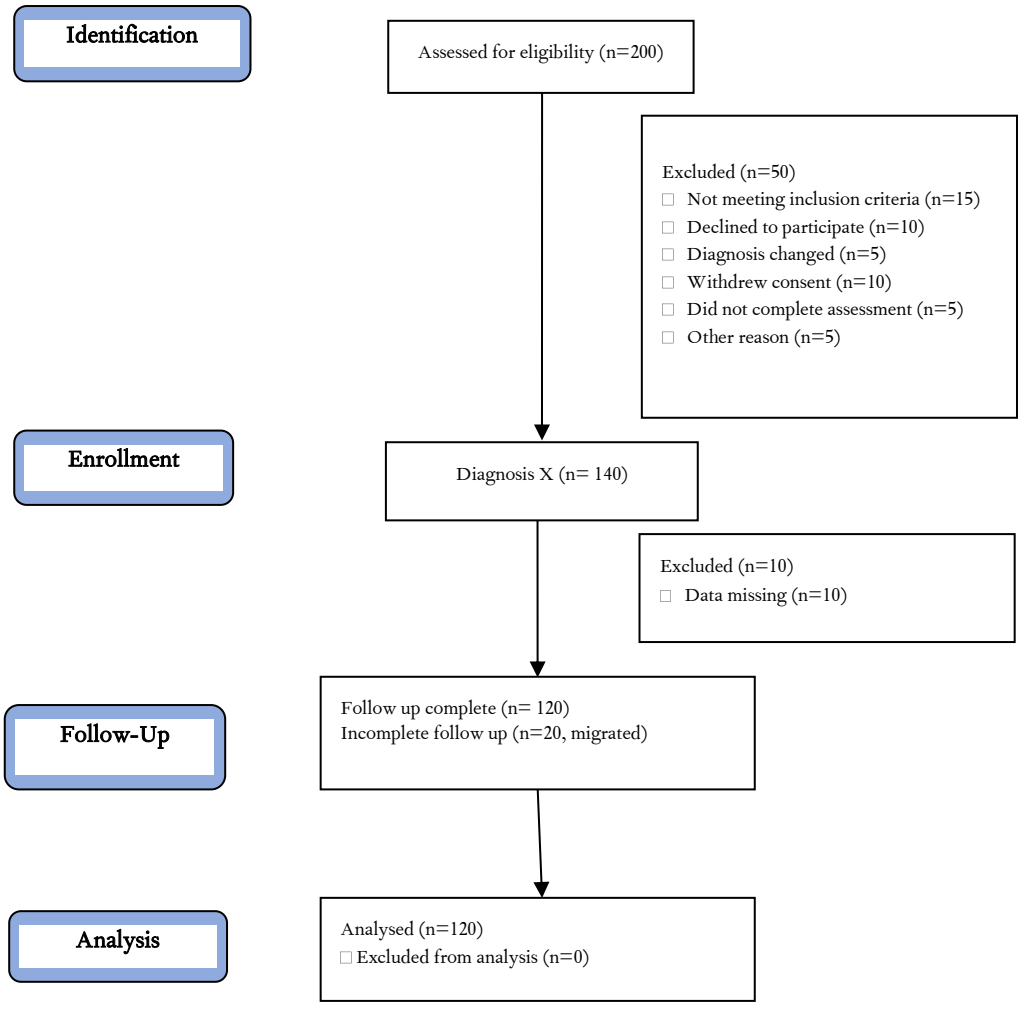

Fig 2: STROBE diagram showing the flow of participants

Describe how missing data were handled (e.g., "Last observation carried forward was used to impute the missing data") and which level of significance was considered in the study (e.g., "P<0.05 was considered significant"). If any corrections were used for multiple testing (e.g., Bonferroni correction or Hochberg procedure), it should be specified, including the resulting p-value that was eventually used.

Some suggestions for writing good methods section

Be exhaustive

This section is one of the longest in the manuscript. Describe in detail all the aspects of the study methodology as described above. Though the typical readers are less likely to go through the minutiae detailed in this section, the editors and peer reviewers will assess it for internal validity and judge your study based on the information provided here.

Use algorithms or figures

The flow of participants in the study can be described using a diagram. A CONSORT diagram is available for randomized clinical trials (e.g. Fig 1). A similar flowchart can be used for observational studies, too (e.g. Fig 2). Sometimes, figures can be helpful to summarize part of an experiment (e.g., sites of stimulation as in Fig 3) or a complete experimental setup.

Avoid writing results

Do not write how many participants were screened and how many were recruited, which is part of the results. (e.g., instead of "304 patients were screened, and of them, 240 were recruited," mention "consecutive patients were screened and those fulfilling eligibility criteria were recruited").

Mind your Language

Write in the past tense

The content in the methods section is written in the past tense. This is the only change required in the content

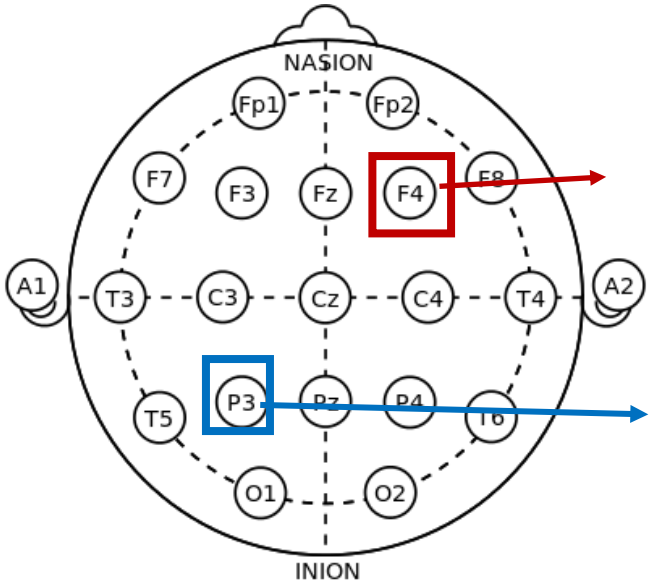

Fig 3: Transcranial direct current stimulation showing anode (F4) and cathode (P3)

written in the protocol, which would have used future tense. Use active rather than passive voice. For example, instead of writing "…50 patients with depression were recruited in the study," mention as "We recruited 50 patients with depression…"

Add variations

Do not write in a boring style. For example, "We recruited ….", "We administered…", We evaluated…". Occasionally, adding passive voice sentences is required to break the monotony. However, it is advisable not to mix both active and passive voices in the same paragraph.

Avoid common mistakes

Some language errors commonly encountered in this section are Writing "performa" instead of "proforma;" writing "population" instead of "sample" in a few places, probably to introduce variety; writing "student's t-test" instead of "Student's t-test" (the s needs to be capitalized); writing Fischer exact test or Fisher exact test instead of Fisher's exact test; writing X2 instead of $\chi 2$ (use the Greek letter chi and not X from English); confusing between random sample and randomization (the former is a sampling strategy, whereas, the later is an allocation method used in randomized trials).

Be careful while writing about descriptive and inferential statistics in the Statistical Analysis section. Rather than using the same verb to describe them both (e.g., "Mean, standard deviation, and correlation were carried out." or "Means, standard deviation, and non-parametric analyses were done"), describe them separately and specify which variables were examined (e.g., "Mean, and standard deviation were computed for X, and Y. Pearson's correlation analysis was carried out to examine the relationship between X and Y." "Means and standard deviation were calculated for continuous variables. Non-parametric analyses (Mann-Whitney U and Kruskal-Wallis test) were done to compare group differences for X and Y").

You cannot mess up the recipe!

The methods section is the most crucial part of the manuscript. A poorly written section will cast doubt in the readers' minds about the study's internal validity. Also, omitting essential methodological details risks rejection by the editors. Don't add new elements that are not mentioned in the protocol. The reviewers and editors are likely to cross-check the methods section from the protocol if publicly available in trial registries. If written well, it is one of the strongest parts of the manuscript.

Suggested readings

1. Cargill M, O'Connor P. Writing Scientific Research Articles - Strategy and Steps. John Wiley & Sons: Chichester, UK. 2009.
2. Katz MJ. From Research to Manuscript-A Guide to Scientific Writing, 2e. Springer Science: Cleveland. 2009.
3. Sahni P, Aggarwal R, editors. Reporting and Publishing Research in the Biomedical Sciences. Springer: Singapore. 2018.

Column: Methods in Psychiatric Research

CASE-CONTROL STUDIES

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ABSTRACT
Case-control studies (CCS) are observational analytic studies done often in instances of rare cases or outcomes. A case-control study compares clearly defined cases and controls arising from the same population for well-measured exposures. The ease of conduct of the study in terms of resources makes CCS popular. However, since the direction of the study is retrospective, selection and measurement biases are potential threats to the validity of conclusions from CCS. Moreover, CCS does not give a direct estimate of the risk. Another issue with the CCS study is confounding. How these validity issues could be addressed are also discussed.
Keywords: Case-control study, selection bias, measurement bias. odds ratio

Case-control studies (CCS) are observational analytical studies in which the association between disease and potential risk factors is assessed by taking samples of cases (with disease) and controls (who are at risk of developing the disease).[1] Then, the frequency of exposure to potential risk factors is measured in both the groups by looking backwards in time. Hence, CCS are also known as retrospective studies.[2] What makes these studies retrospective is that the outcome of each participant is known to the researcher when the subjects are recruited for the study.[3] This study design is used to study the risk factors of rare diseases or outcomes and to investigate outbreaks of acute diseases like infectious diseases. Although risk ratio cannot be computed directly, an estimate of it can be obtained from these studies through odds ratio. [2,3]

An investigator must focus on the following steps while designing a CCS:

- Selection of cases
- Selection of controls
- Measurement of exposure
- Addressing bias
- Addressing confounding

Selection of cases

Cases are those that have developed an outcome of interest. A clear definition of the outcome which is being studied must be provided. This could be clinical symptoms or diagnostic criteria or by using diagnostic tools or laboratory methods. Further, the age range of the participants, the location from which they are selected (hospital-based or population-based) or other eligibility criteria and exclusion criteria have to be explicitly stated.[2] As many sources of information can be used to ascertain the disease status or the outcome of interest like hospital records, death certificates, logbooks, registries, clinical evaluation, laboratory investigations, or diagnostic tools.

A CCS can include all the cases or a representative sample of cases from a defined population. Preferably, new or incident cases, rather than existing prevalent ones, should be selected. If prevalent cases are studied,

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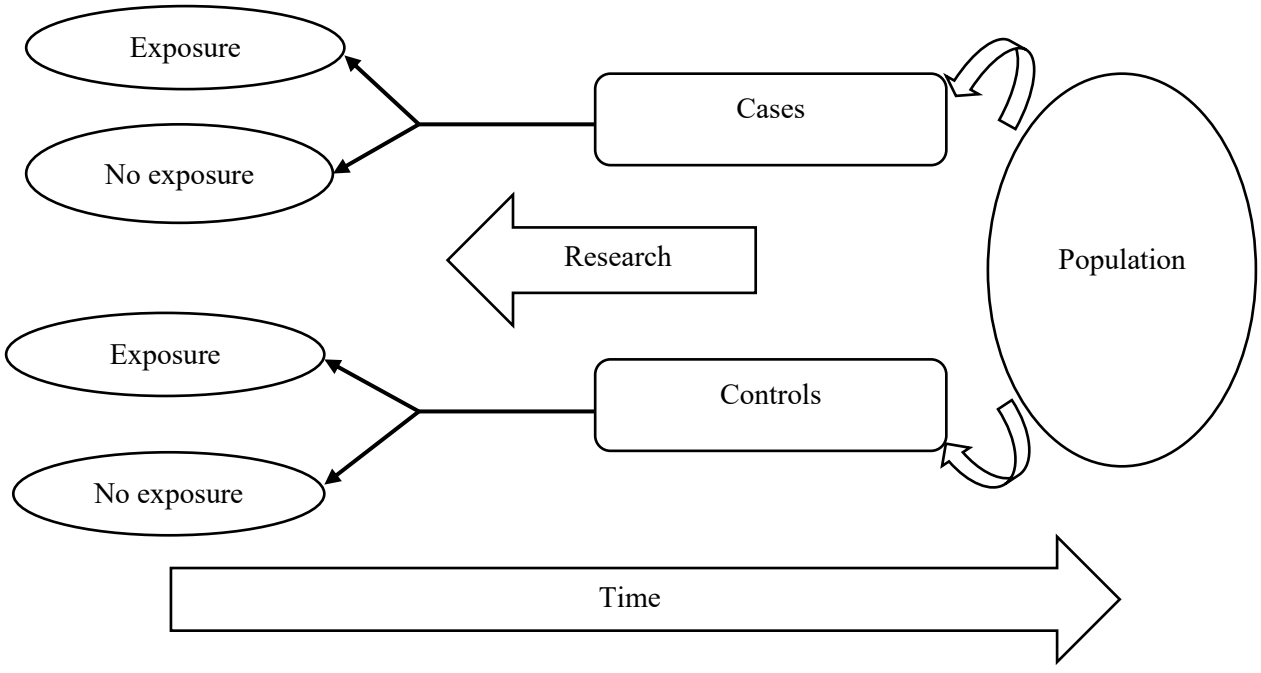

Figure 1. Design of case-control studies

the risk factors identified may be those determining the incidence or development of the disease, duration, or both; the contribution of the exposure to the development of the outcome cannot be determined.[2] So also, incident cases reduce recall bias.[5]

Selection of controls

Cases and controls should be comparable for the case-control study to be valid. For this, the controls would have been cases had they developed the outcome of interest. Cases and controls should be from the same base population and should have an equal chance of being exposed.[2] Controls should not have the disease and should be selected from the same population at risk for the disease; they should represent the target population.[5] The controls provide the background proportion of exposure that is expected in the cases.[4]

The process of selecting controls should be independent of the exposure being studied.[4] Controls can be selected from the population from which the cases were selected based on probability sampling (population-based CCS) or from a cohort from which the cases are drawn (nested CCS). If the cases are selected from a hospital, controls can be selected from patients with different diseases (other than the outcome of interest), from the same setting (hospital-based CCS). Controls can also be identified from the community from which the hospital draws patients. They can also be drawn from among the friends, relatives or neighbours of the cases.[2,6] Multiple control groups can be chosen – one from the same hospital and another from the community from which the cases are drawn. As against this, multiple controls can be selected per case if the number of cases is less or the outcome is rare. This can increase the power of the study. [2,5] A case: control ratio of 1:1 is the most optimum; beyond 4:1, the increase in statistical power is not marked.[7]

Matching the cases and controls for one or more characteristics can be done to ensure that the two groups are comparable. Usually, matching is done for age, sex or place of residence. This is a strategy used to adjust for confounding variables. But matching the cases and controls for too many variables leads to overmatching and can bias the study by finding no significant association.

Measurement of exposure

Exposure information can be collected from the participants or their surrogates (mothers of children or caregivers of dementia patients) through direct interviews, questionnaires, or medical records.

Figure 2. Calculation of Odds Ratio from a case-control study

	Cases	Controls	
Exposure	a	b	a + b
No exposure	c	d	c + d
	a + c	b + d	

Odds of exposure among cases = a/ (a + c) ÷ c/ (a + c) = a/c

Odds of exposure among controls = b/ (b + d) ÷ d/ (b + d) = b/d

Odds ratio = a/c ÷ b/d = ad/bc

interviews, questionnaires, or medical records. Information should be obtained using similar procedures from both cases and controls.[8] There is a greater likelihood of the cases recalling the exposure than the controls, leading to recall bias. The report of exposure by the interviewer can vary systematically between the cases and controls, thereby leading to interviewer bias. Blinding the interviewer to the case-control status and the hypotheses being tested can help reduce this bias.[5] Using multiple sources of information – like treatment records documented before the outcome – to evaluate the exposure can also minimise measurement bias.

Addressing bias

The potential for bias – systematic error in collecting or interpreting data– is a major factor that affects the validity of CCS. This can affect the interpretation of the hypotheses obtained from that data. Selection bias occurs when the exposure of interest affects the selection of cases and controls in some manner,[8] E.g., Heavy smokers refusing to participate in a study to assess the risk of lung cancer can lead to selection bias. Interviewer bias occurs when the interviewer ascertains the exposure with greater enthusiasm from the cases than controls. The observer being aware of the case-control status can contribute to this bias, and blinding can prevent this. Recall bias was alluded to earlier. Both the recall bias and interviewer bias are examples of measurement or ascertainment bias. In the case of a CCS, such a bias leads to misclassification of exposure, thus leading to a wrong estimate of the risk.

A detailed discussion of biases is beyond the scope of this article. The possibility of biases must be considered and addressed carefully while designing a CCS. Appropriate definition and selection of cases and controls, explicit definition and proper and uniform measurement of the study variable and covariates are essential to prevent bias.

Addressing confounding

A confounding variable is independently associated with the exposure and outcome variables. It can distort the effect of the exposure on the outcome.[2] During the designing of the study itself, potential confounders must be identified and addressed. Potential confounders can be addressed in the design phase and the analysis phase of CCS. In the design phase, the potential confounders can be controlled by restriction (exclusion) or matching. However, the effect of these variables on the outcome cannot be assessed further. In the analysis phase, stratification of the data based on the confounding variable and assessment of Mantel Haenszel Odds Ratio, and logistic regression can be used to adjust for the effect of the confounder. For this, planning is required in the design phase to ensure that the data regarding the confounding variable is collected during the study.[4]

Analysis

In CCS, Odds Ratio (OR) is the measure of the strength of association between the exposure and outcome variables. It is the ratio of the odds of exposure among cases to the odds of exposure among controls (See Figure 2). A greater frequency of exposure among cases leads to an OR >1, suggesting that it is a risk factor. On the other hand, a lesser frequency of exposure among cases leads to an OR <1,

suggesting that it is a protective factor. If OR = 1, the odds of exposure is the same in cases and controls. This implies that exposure is neither a risk factor nor a protective factor.[2,6] Univariate analysis provides crude OR, while multivariate analysis provides adjusted OR, adjusted for confounding variables.

It is imperative to assess the 95% Confidence Interval (95% CI) of the OR. If the 95% CI of the OR includes the null value of 1, it can be concluded that the *P*-value from the test of statistical significance would be greater than 0.05. E.g., If the OR is 1.8 with a 95% CI of 0.63 – 4.5, it can be concluded that the association is not statistically significant. On the other hand, if the OR is 1.8, with a 95% CI of 1.2 – 3.4, it can be inferred that the association is statistically significant. Both *P*-value and CI together give maximum information about the role of chance in obtaining the finding.[8]

The OR estimates the relative risk (RR), especially when the incidence of the disease or outcome is low. Generally, when the disease rates in the unexposed population are less than 1/100, the OR becomes approximately equal to the RR. [2]

Advantages of CCS:

- They are quick and inexpensive
- Appropriate design to study rare diseases
- Appropriate design to study diseases with a long latent period
- Multiple exposure factors can be studied for a single outcome. [8]

Disadvantages of CCS:

- Inefficient to study rare exposures
- Cannot study multiple outcomes
- Incidence rates of disease or outcome measures cannot be computed
- The temporal relationship of exposure and outcome is difficult to establish
- Particularly prone for bias like selection and recall bias [7,8]

Conclusion

In designing a CCS, investigators must explicitly define the cases or outcome variable, select controls meticulously and measure exposure variables accurately. The potential biases and confounding factors have to be thought of and addressed in the design phase of the study itself. Properly designed and well-executed CCS can provide ORs which can be reliable estimates of relative risk. They can be very efficient in identifying the association between exposure and outcome variables. While reporting CCS, a checklist of the items to be included is provided by the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) statement.[9] This can aid in providing a thorough description of the methodology used in CCS. A critical appraisal of the methodology and acceptance of the validity of the findings is also made possible.

REFERENCES

1. Breslow NE. Case-Control Studies. In: Ahrens W., Pigeot I. (eds) Handbook of Epidemiology. Springer, Berlin, Heidelberg. 2005. pp. 287-319. Available from: https://doi.org/10.1007/978-3-540-26577-1_7
2. Fletcher RH, Fletcher SW. Risk: Looking backward. In: Clinical epidemiology: The essentials. Fourth Edition. Philadelphia: Lippincott Williams & Wilkins. 2005.
3. Lewallen S, Courtright P. Epidemiology in practice: Case-control studies. Community Eye Health 1998;11(28):57-8.
4. Schulz KF, Grimes DA. Case-control studies: research in reverse. Lancet 2002;359:431-4.
5. Levin KA. Study design V. case-control studies. Evidence-Based Dentistry 2003;7:83-84. doi:10.1038/sj.ebd.6400436
6. Alexander LK, Lopes B, Richetti-Masterson K, Yeatts KB. Case-control studies. ERIC Notebook. Second Edition. Available from: https://sph.unc.edu/wp-content/uploads/sites/112/2015/07/nciph_ERIC5.pdf
7. Sethia MS. Methodology series module: Case-control studies. Indian J Dermatol 2016;61:146-51.
8. Hennekens C, Buring J. Case-control studies. In: Epidemiology in medicine. Boston, Toronto: Little Brown & Co. 1987.
9. von Elm E, Altman DG, Pocock SJ, Gotzsche PC, Vandenbroucke JP. Strengthening the reporting of observational studies in epidemiology (STROBE) statement: guidelines for reporting observational studies. BMJ 2007;335:806-8. Available from: doi:10.1136/bmj.39335.541782.ad