

Research Report

GENDER DIFFERENCES IN BIPOLAR DISORDER- A CROSS-SECTIONAL STUDY IN CENTRAL KERALA

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ABSTRACT

Introduction: There is a need for better recognition of the nature and course of bipolar disorder among both genders as it may improve the quality of care. The objective of the study was to identify gender differences in sociodemographic characteristics and illness characteristics among patients with bipolar disorder presenting to a tertiary care centre. **Methods:** This was a cross-sectional descriptive study comparing 50 males and 50 females with a diagnosis of bipolar disorder, current episode manic according to DSM 5 criteria. The sociodemographic and illness-related data were collected from a reliable informant, and the Young Mania Rating Scale (YMRS) was applied. **Results:** The total number of episodes was similar between genders; however, the number of depressive episodes ($p < 0.000$) was more in females. The majority of males had the first episode of mania, whereas the first episode in females was mostly depressive ($p = 0.009$). Comorbid medical illnesses especially, hypothyroidism and obesity, were seen more often in women and substance use was higher in men. **Conclusion:** It was found that women often had depressive episodes, whereas a manic picture was commonly seen in men. Endocrine and metabolic abnormalities were more often seen in women with bipolar disorder, while substance abuse was prevalent among men. A substantial difference was noticed in the course, polarity and severity of illness between the genders. This knowledge may provide better insight into adequate treatment strategies for improving the quality of life in persons with bipolar disorder.

Keywords: Gender differences, Bipolar disorder, Cross-sectional study

INTRODUCTION

Bipolar disorder (BD) is a recurrent chronic disorder characterized by fluctuations in mood state and energy levels alternating with periods of normal functioning. Around 1% of the world's population is affected, irrespective of nationality, ethnic origin, or socioeconomic status.¹ A depressive episode is characterized by depressive mood or loss of pleasure along with other neurovegetative, cognitive or behavioural symptoms. In contrast, a manic episode is a definite period of an abnormally and persistently elevated, expansive or irritable mood. Patients with

manic and depressive episodes or only manic episodes are included under bipolar disorder.^{2,3}

The onset and course of bipolar disorder in men and women were observed to be different in various aspects. Females were at a greater risk for affective disorders than men; however, the prevalence of bipolar disorder was found to be almost equal in both sexes.^{4,5} Women with bipolar disorder were reported to have fewer episodes of mania and more depressive episodes when compared to men.⁵ They were also found to have a later

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age of onset and had a higher chance of being rapid cyclers.^{2,6,7} It was reported that bipolar I disorder was of almost equal distribution, whereas bipolar II disorder was more common in females.⁸ Onset in the fifth decade was also seen more in females.⁹ Some evidence suggests that the first episode in males is likely to be a manic episode while the first in females is likely to be a depressive episode.^{7,10} This was also supported by a French study which added that males with bipolar disorder were younger and more often single, having an early onset and longer duration of illness.¹⁰ Seasonal pattern of illness was noted to be more in women, often having depressive episodes in winters.¹¹ Lifetime history of psychosis in bipolar disorder was noticed to be higher in women in a study by Yildiz and Sachs.¹² Medical and psychiatric comorbidities were also found to be considerably high in women than men, adversely affecting their recovery.^{13,14} At the same time, the number of hospitalizations were noticed to be higher in women along with higher rates of suicide.¹⁰

Only a few studies in India compare the gender differences in bipolar patients. The course of bipolar disorder was suggested to be different in developing Asian countries like India compared to western countries, with higher rates of manic episodes.¹⁵ Chatterjee and Kulhara found that the mean duration of the manic episode was shorter in females compared to males.¹⁶ Both psychiatric and medical comorbidities were frequently found in patients with bipolar disorder, with endocrine, metabolic, anxiety and eating disorders being more common in females and substance abuse in males.^{8,14} Furthermore, women tend to have a lower quality of life than men.^{7,17} Bhattacharya et al. studied gender differences in manic episodes. They found higher rates of psychomotor activity, psychosis, and grandiosity among men, whereas females had higher rates of mood lability, guilt, and anxiety.¹⁸ Depression was found to be more severe in women with suicidal feelings, agitation and anxiety being predominant in a study by Saraf AS.¹⁹ A study conducted in a tertiary care centre of South India noted that disability was more in women with poorer quality of life, which was also supported by studies done by Robb et al. and Sylvia et al.^{7,17,20} The pharmacotherapy of females was also considered to be more complicated than males due to the atypical and mixed presentations of the illness, however treatment adherence was found to be much better in

females.^{21,22}

The gender differences in the course and prognosis of bipolar disorder are poorly studied in the Indian context, with hardly any similar studies conducted in Kerala. Also, the study conducted by Thomas SP et al. in Kerala showed significant differences in the disability level across gender, highlighting the need to identify the factors contributing to this disability.²⁰ Hence, there is a need for better identification of the differences in the demographic, clinical profile and other factors across gender, which in turn can have important treatment implications by reducing disability and improving the quality of life.

The objective of the study was to identify gender differences in sociodemographic characteristics and illness characteristics among patients with bipolar disorder presenting to a tertiary care centre.

MATERIAL AND METHODS

Study Design

A cross-sectional descriptive study was carried out in the Department of Psychiatry in a tertiary care centre of Central Kerala over six months. The study sample consisted of 50 male and 50 female inpatients diagnosed with Bipolar Disorder, current episode manic according to DSM 5 criteria, in the age range of 18 to 60 years. Patients with debilitating illnesses (coronary artery disease, cerebrovascular accident, chronic liver disease, chronic kidney disease and chronic arthritis) and organic affective disorders were excluded.

Using figures from the study by Robb et al.⁷, the required minimum sample size was calculated as 46 in each group, rounded to 50. The given set of formulas was used:

$$k = \frac{n_2}{n_1} = 1, n_1 = \frac{(\sigma_1^2 + \sigma_2^2/K)(z_{1-\alpha/2} + z_{1-\beta})^2}{\Delta^2}, n_2 = K * n_1$$

Consecutive sampling was used till the sample size was achieved.

Study tools

- A semi-structured proforma
- Young Mania Rating Scale (YMRS) is an 11-item scale to assess the manic symptoms and is based on the patient's subjective report of their clinical

condition over the previous 48 hours. It is a clinician-rated scale and takes 15-20 minutes to complete.

Method of Data Collection

The study was conducted among those BD patients admitted to the psychiatry ward during a current manic episode. The sociodemographic and illness-related details were collected from a reliable informant. Young Mania Rating Scale (YMRS) was administered on the day of admission. BMI was calculated as early as the patient got cooperative, and a value of 25 or more was diagnosed as overweight. Insight into the illness was assessed at the time of discharge. Comorbid medical diagnoses (as diagnosed by the physician apart from ones excluded) like hypertension, diabetes, hypothyroidism and dyslipidaemia were also recorded. Substance abuse was taken as those taking alcohol, tobacco or other psychoactive substances in a harmful pattern for a minimum duration of one month.

Statistical Analysis

Statistical Package for Social Sciences 20.0 for Windows was used for analysing the data. Qualitative variables were expressed as frequency and percentages, and quantitative variables as mean and standard deviation. Mann Whitney U test was used to examine group differences across gender for continuous variables, and chi-square test was used for categorical variables. P-values less than 0.05 were considered significant.

RESULTS

Sociodemographic Characteristics

The demographic differences across gender are summarized in Table 1. There was a significant difference in the age across gender of the sample population, the majority of males being between 18-32 years ($p=0.023$). Significant differences in education and occupation were found; most females had a diploma/graduate degree, and a higher proportion of females were homemakers or doing skilled work ($p=0.021$). A significantly higher number of females were married than mostly single males ($p=0.021$).

Clinical Characteristics

Table 2 & 3 shows the clinical differences across gender. Mean duration of illness, age of onset, the total number

Table 1 Differences in sociodemographic variables across gender in individuals with bipolar disorder

	Male (n=50)	Female (n=50)	p- value
Age in years			
18-31	25 (50)	18 (36)	
32-45	12 (24)	25 (50)	0.023*
46-59	13 (26)	7 (14)	
Education			
Primary	18 (36)	3 (6)	
Secondary	8 (16)	14 (28)	
Diploma/Graduate	22 (44)	29 (58)	0.003*
Postgraduate	2 (4)	4 (8)	
Occupation			
Unskilled	11(22)	0 (0)	
Skilled	7 (14)	26 (52)	
Non-professional	10 (20)	8 (16)	0.021*
Professional	6 (12)	6 (12)	
Unemployed	16 (32)	10 (20)	
Marital Status			
Single	27 (54)	14 (28)	
Married	17 (34)	30 (60)	0.021*
Divorced/widowed	6 (12)	6 (12)	
Religion			
Hindu	24 (48)	15 (30)	
Muslim	4 (8)	2 (4)	0.084
Christian	22 (44)	33 (66)	
Residence			
Rural	21 (42)	24 (58)	
Semi urban	29 (48)	26 (52)	0.826
Income			
Low	11 (22)	7 (14)	
Middle	36 (72)	40 (80)	0.549
High	3 (6)	3(6)	

Table 2 Differences in clinical variables across gender in individuals with bipolar disorder

	Male (n=50)	Female (n=50)	p-value
Total duration (years) -mean	13.11	14.53	0.383
Age of onset of illness (years) -mean	22.94	22.26	0.707
Number of episodes -mean	5.96	6.58	0.102
Number of manic episodes -mean	5.38	4.94	0.956
Number of depressive episodes -mean	0.52	1.56	<0.001*
Number of psychotic episodes -mean	1.62	2.14	0.077
Maximum intermorbid period -mean	4.53	5.63	0.148
H/o Suicide attempt -N (%)	8 (16)	12 (24)	0.317
H/o Extrapyramidal side effects- N (%)	25 (50)	4 (8)	<0.001*
Drug compliance -N (%)	12 (24)	21 (42)	0.056
Family history of psychiatric illness -N (%)	37 (74)	32 (64)	0.280

*p= <0.05

of episodes, the number of manic episodes, and the maximum inter-morbid period were almost identical. However, the number of depressive episodes was significantly higher in females ($p < 0.001$). The presence of precipitating factors in the first episode of bipolar disorder was found more in females ($p=0.047$). The first episode was more often depressive in females and manic in males ($p=0.09$). The extrapyramidal side effects were found to be significantly higher in males ($p < 0.001$), while drug compliance was found to be poorer in females. However, the YMRS score was found to be significantly higher in males ($p < 0.001$).

Physical and Psychiatric Comorbidities

Table 4 summarizes medical comorbidities and substance use disorders across gender. Medical comorbidities were significantly higher in females than in males ($p=0.001$). Hypertension ($p=0.037$) was found to be significantly higher in males, while hypothyroidism ($p=0.003$) and overweight ($p=0.001$) was found to be significantly higher in females. Rates of diabetes and dyslipidaemia did not differ significantly across gender. A significantly higher proportion of males had comorbid substance abuse ($p < 0.001$).

DISCUSSION

The study compared 50 male and 50 female patients with bipolar disorder currently in a manic phase, with special attention given to the nature of the first episode. It showed no gender difference with respect to the total duration of illness, age of onset and the total number of episodes like the other Indian studies.^{8,23} However, in the western literature, there are inconsistent results regarding the age of onset. McMohan et al. reported that women had an earlier onset of affective disorders; studies by Robb et al. and Viguera et al. found a later age of onset, while several others showed no difference.^{7,12,13,24-27} This is relevant as early age of onset was found to have increased rates of psychosis, comorbid psychiatric disorders, increased suicide risk and neurocognitive dysfunction, leading to a poorer prognosis of the illness.²⁸ As in studies by Angst et al. and Pillai et al., the number of depressive episodes were significantly higher in females, indicating that women are more prone to depressive illness.^{6,8} It was found that the number of manic episodes was almost the same in both genders, similar to a study done by Kawa et al.²⁶ But several other studies showed that the number of manic episodes was higher in males.^{7,14}

Like Pillai et al., the male population belonged to a younger age group when compared to females. This distinction, without any significant difference in the mean age of onset or number of episodes, may be because of males getting more severe manic episodes that require admissions early in the course of the illness.⁸ Our study itself had found that the YMRS score was significantly higher in men. It could also be due to comorbid substance use, worsening the natural course

Table 3. Differences in clinical variables across gender in individuals with bipolar disorder

	Male (n=50)	Female (n=50)	p-value
<u>1st episode</u>			
precipitating factor	31 (62)	40 (80)	0.047*
Depressive episode	10 (20)	23 (46)	
Manic episode	38 (76)	23 (46)	0.09*
Psychotic episode	2 (4)	4 (8)	
<u>Treatment sought</u>			
No	5 (10)	7 (14)	
OP	6 (12)	13 (26)	0.241
IP	36 (72)	27 (54)	
Others	3 (6)	3 (6)	
<u>Current episode</u>			
<u>Duration of stay</u>			
<1 week	7 (14)	13 (26)	0.325
1-2 weeks	36 (72)	31 (62)	
>2 weeks	7 (14)	6 (12)	
YMRS score- mean	29.6	21.4	<0.001*
<u>Insight</u>			
Grade 1	0 (0)	1 (2)	
Grade 2	9 (18)	9 (18)	0.793
Grade 3	24 (38)	20 (40)	
Grade 4	25 (40)	7 (34)	
Grade 5	2 (4)	3 (6)	

*p= <0.05

of illness. It was also noted that females were of better educational status when compared to men. Considering the similar socioeconomic and cultural background, whether the

Table 4 Comorbidities across gender in individuals with bipolar disorder

	Male (n=50)	Female (n=50)	p-value
Medical comorbidities	25 (50)	41 (82)	0.001*
Hypertension	10 (20)	3 (6)	0.037*
Diabetes Mellitus	11 (22)	7 (14)	0.298
Dyslipidaemia	1 (2)	3 (6)	0.307
Hypothyroidism	3 (6)	14 (28)	0.003*
Overweight	13 (26)	29 (58)	0.001*
Substance abuse	23 (46)	0(0)	<0.001*

*p= <0.05

illness alone should be considered as a contributing factor for this difference remains controversial. The influence of externalizing disorders, premorbid temperament, and other factors need to be considered. However, females pursuing higher education reflects Kerala's social and cultural advancement. As in other studies, most females were married compared to males.^{7,10} Most of the patients belonged to the middle socioeconomic status, irrespective of gender, and reflect patients availing of clinical services in this hospital; the findings were similar to the previous study.²⁹

On evaluating the first episode, higher rates of mania were noted among men in this study, which was similar to studies done by Kawa et al. and Hendrick et al.^{10,13,26} However, several others found no such gender difference.^{27,30} It was also found that females had significantly more depressive episodes, preceded by a significant precipitating factor. This highlights the importance of the biopsychosocial approach towards mental illness. The majority of the study sample was found to have received psychiatric care during the first

episode, which may imply better awareness, education and less stigma related to mental illness in our society.

In this study, no major differences across gender were seen while comparing the maximum inter morbid period, suicide attempts in the past and family history of psychiatric illness, which was similar to other studies.^{8,25,26} However, suicide attempts in women were said to be 2–3 times more often than in men in the general population. Women with BD were said to more often attempt suicide than bipolar men.^{10,31} 69% of the study sample had a family history of bipolar illness, which was similar to study based on data from the Danish Psychiatric Central Register (DCPR), in which there was a 14-fold higher risk of bipolar disorder in first degree relatives of index patients with bipolar disorder.³² Though not significant, this study also found that the number of psychotic episodes in bipolar disorder was more common in women than in men, with similar evidence in a study by Yildiz and Sachs.¹² But it was not of much difference across genders in several other studies.^{8,20,26,27}

Only 33% of the sample had good drug compliance. It was, however, noted that females had slightly better compliance than men. The significantly higher incidence of EPS in men than women may have a contributory effect.³³ Most of the patients had a period of hospitalization of around 1–2 weeks, and the majority were found to have an insight of grade three or four at the time of discharge. Despite a fairly good insight, the drug compliance was noted to be poor, which expresses the need to look for other factors which might hinder regular drug intake. Not much gender difference was seen in these aspects.

Higher physical comorbidities were found in females; hypothyroidism and overweight were significant, which was also seen in other studies.^{8,10} Hypertension was found to be high in males of this study. The rates of substance abuse were higher in males than females, specifically tobacco and alcohol, which was consistent with the previous reviews.^{6,8,27} Substance use in dependence patterns, especially alcohol, may mask the underlying bipolarity, delaying appropriate diagnosis and treatment. Its effect on the severity and drug compliance needs to be looked into. Comorbid physical and psychiatric illness may worsen the quality of life of bipolar disorder.

There is usually a misdiagnosis of bipolar depression as unipolar depression due to its nature of presentation, which may lead them to receive antidepressants that can have a risk of destabilization of illness. This is often seen in women who are prone to depressive diathesis of bipolar disorder, have episodes with a lengthy course, and are resistant to treatment compared to men.³⁴ Additional challenges in treating women with bipolar disorder include pregnancy and lactation and premenstrual and post-menopausal periods. Though pregnancy neither protects nor exacerbates bipolar disorder, receiving mood stabilizers may pose a risk to the foetus and infant. In males, substance abuse may have a poorer outcome for the disease.

LIMITATIONS AND FUTURE DIRECTIONS

The study was conducted cross-sectionally with a small sample size in which those who required inpatient treatment for current manic episodes were only included, limiting its generalization. There is also a possibility of selection and recall bias. However, despite the various limitations, this study has given us few insights into the clinical course of bipolar illness in the Indian context.

Taking up this study further by assessment of these details along with the quality of life and disability level during the euthymic phase of these individuals may further enhance the knowledge on the gender differences and also including a larger sample may help in generalising to community level.³⁵

CONCLUSION

It was found that there was a substantial difference in the course, polarity and severity of illness across the gender. Women often had depressive episodes, whereas a manic picture was commonly seen in men. Endocrine and metabolic abnormalities were more often seen in women with bipolar disorder, while substance abuse was noted to be prevalent among men with bipolar disorder. Knowledge about the gender differences may provide insight into the optimum assessment and treatment strategies for improving the quality of life of these individuals.

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Conflict of interest:

None declared.

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