COMPARATIVE STUDY ON THE BURDEN OF BIPOLAR AFFECTIVE DISORDER AND SCHIZOPHRENIA

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ABSTRACT

BACKGROUND

Mental and behavioural disorders have a large impact on individuals, family and communities. There is a paucity of studies on burden and cost of illness of Bipolar Affective Disorder both internationally and in India. Such studies are important for clinical management and policy decisions.

Aim of the study - The aim of the present study is to assess the magnitude of the cost of illness and family burden of Bipolar Affective Disorder and Schizophrenia and to find out the difference in the burden of the caregivers for both the groups.

MATERIALS AND METHODS

The study was conducted in the outpatient department of Institute of Mental Health, Chennai. Sixty patients in each group were included by stratified sampling. Caregivers living with patients for atleast one year are included in the study, and those with any comorbid illness, were excluded from the study. ICD -10 diagnostic and research criteria were used for diagnosis of BPAD and Schizophrenia, Questionnaire for Assessment of Cost of Illness was used to assess cost of illness and Family Burden Interview Schedule was used to assess burden of caregivers.

RESULTS

Schizophrenia patients are mostly from urban, nuclear family. The illness characters & sociodemographic profile of caregivers are comparable. Lifetime costs and loss of income over lifetime was more in schizophrenia. Loss of income in the past year was similar. The burden was comparable for caregivers of both groups in disruption of family routine, interaction with family members, effect on mental health.

CONCLUSION

Burden of both diseases were comparable except schizophrenics experience more financial burden.

KEYWORDS

Schizophrenia, Bipolar Affective Disorder, Cost of Illness, Family Burden.

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BACKGROUND

Mental and behavioural disorders have a large impact on individuals, families and communities. World Health Report of 2004 has estimated that the Disability Adjusted Life years (DALY) for Bipolar Disorder ranked 6 ahead of Schizophrenia at number among persons aged 15 to 44 years.[1] With rise in life expectancy and deinstitutionalization the burden is transferred to the family. Family burden refers to the practical and psychological problems experienced by families of patients and can be subjective (personal impact experienced by caregivers) and objective (financial burden, impact on family interaction, leisure, routine activities & mental and physical health of care givers). The concept of burden shares a reciprocal relationship with social performance.[2] The cost of illness was described by Shah et al in 2000.[3] The cost to the patient includes cost to individual, costs to the family and cost of treatment, both direct and indirect.[4]

The initial studies on the burden of caregivers was done in 1955[5] and 1961 assessed the burden of the families.[6] The foundation for the current research on burden was put forward in 1968[7] including worrisome behaviour of patients, disruption in physical health, leisure activity, relation with significant others, domestic routine, income, subjective feeling of burden. In further studies in 1965, classified that subjective and objective burden. Several attempts were made to develop measures to quantify the burden from 1965-1998.[8-13] Studies found that 37% of Bipolar Affective Disorder patients were unemployed[14] and around 25% of bipolar patients with affective relapses had steady work two and five years follow up.[15] Roy Chaudhuri et al in 1995[16] studied family burden among long term patients of Schizophrenia and Bipolar Affective Disorder using Pai and

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Kapur's Interview Schedule[10] to measure objective burden, Sell & Nagpal's Subjective Well Being Inventory (SUBI-1992)[17] to measure subjective burden and found the burden was significant for Bipolar Affective Disorder and was more in case of Schizophrenia. Chakrabarti et al in 1995 did a comparative study of Family Burden in Schizophrenia, and all Affective Disorders and found that subjective and objective burden are more in schizophrenia than bipolar patient's family.[18] The Burden Score correlated significantly with SANS score and DAQ scores (Dysfunction Analysis Questionnaire). Sharma et al at IHBAS in 2006 estimated the monthly cost of two major mental disorders and concluded that the cost for bipolar disorder was higher than that of schizophrenia.[19]

There is a paucity of studies on burden and cost of illness of Bipolar Affective Disorder both internationally and in India. The relevance of these studies is not with respect to just clinical management but also in policy decisions for enhanced State support. Hence it was decided to study the burden and cost of illness of Bipolar Affective Disorder and compare it with that of Schizophrenia.

The aim of the present study is to assess the magnitude of the cost of illness and family burden of Bipolar Affective disorder and Schizophrenia and to find out if there is difference in the burden of the caregivers for both the groups of patients.

MATERIALS AND METHODS

The study was conducted in the outpatient department of Institute of Mental Health (IMH), Chennai, a tertiary care hospital catering for Chennai, neighbouring districts, and states. All adult patients from 18-60 years attending OPD services assessed with ICD-10 diagnostic and research criteria.[20] Every 6th schizophrenia patient and every 3rd BPAD patient were included in the study. Sixty patients in each group were included by stratified sampling. Sampling interval was maintained when patient did not qualify as per inclusion criteria. Caregivers living with patients for at-least one year are included in the study, and those with any comorbid physical illness, psychiatric illness, substance use, any other family member with psychiatric illness were excluded from the study. The study tools include a semi structured questionnaire to assess the sociodemographic details, Questionnaire for Assessment of Cost of Illness - a semi structured questionnaire with items to assess the direct, indirect and intangible costs of both Bipolar Affective Disorders and Schizophrenia. Direct Cost includes costs associated directly with diagnosis, treatment, and rehabilitation and Indirect Cost includes loss of income due to loss of productivity by the patient, loss of income to caregiver, transport costs, treating comorbid conditions, Intangible costs includes deterioration in quality of life to patients, families, and friends due to other factors, such as pain or suffering. Current cost of medicine and transport in the past one year contribute to current direct cost while the loss of income in the past one year contribute to current indirect cost. Lifetime costs include total money spent on treatment, cost of private consultation, Cost of hospitalization, Cost of faith healer/alternative treatment, Cost of investigation, Monetary losses – all over the lifetime, Loss of income over the lifetime.

Family Burden Interview Schedule Pai and Kapur 1981 was used to assess burden across six domains.[10] This is a semi-structured interview schedule comprising of 24 items grouped under 6 areas- 1) financial burden, 2) disruption of routine family activities, 3) disruption of family leisure, 4) disruption of family interaction, 5) effect on physical health of others and 6) effect on mental health of others. The burden was rated on a 3-point scale for each item, and a standard question to assess the "subjective" burden was also included in the schedule with a reliability of 0.78.[10]

Statistical analysis was done using SPSS ver.20 the frequency distribution of sociodemographic variables and chi square test was used for comparison between two groups involving discreet variables and Wilcoxson signed rank test was used for skewed distributions and discrete variables.

RESULTS

The sociodemographic profile of the patients of Schizophrenia and BPAD are comparable except for marital status, employment, family type, urban/rural residence, distance travelled for health care facility.

Sl. No.	Parameter	Attributes	BPAD	Schizophrenia	Test of Significance	dF	p-value
1.	Sex	Male	41 (68%)	43 (72%)	0.16	1	0.6
		Female	19 (32%)	17 (28%)			
2.	Marital Status	Single	17 (28%)	26 (44%)	5.82	2	0.055
		Married	39 (66%)	26 (44%)			
		Others*	4 (6%)	8 (12%)			
3.	Education	Illiterate	10 (16%)	8 (12%)	0.30	3	0.96
		Primary School	12 (20%)	13 (22%)			
		Secondary School	26 (44%)	26 (44%)			
		Grad/Pg/Prof.Edu.	12 (20%)	13 (22%)			
4.	Working Status	Working	28 (46%)	16 (26%)	13.89	2	0.009
		Non-Working	14 (24%)	34 (58%)			
		House wife	18 (30%)	10 (16%)			
5.	Family Type	Nuclear	35 (58%)	50 (84%)	9.08	1	0.0025
		Joint	25 (42%)	10 (16%)			

6.	Family Income (Rs./Yr.)	<25000	31 (52%)	35 (58%)	1.74	2	0.418
		25000-75000	18 (30%)	19 (32%)			
		>75000	11 (18%)	6 (10%)			
7.	Domicile	Rural	25 (42%)	13 (22%)	4.66	1	0.033
		Urban	35 (58%)	47 (78%)			
8.	Distance Travelled	<10 km	16 (26%)	22 (36%)	12.27	3	0.045
		10- 49 km	14 (24%)	26 (44%)			
		50-149 km	18 (30%)	7 (12%)			
		>150 km	12 (20%)	5 (8%)			
9.	Age (Yrs.)	Mean ± SD	33.32 (±7.95)	32.56 (±8.7)	0.183	118	0.916

Table 1. Socio Demographic Characteristics of the subjects

The mean age of onset of illness in Bipolar Affective Disorder group was 24.8 yrs. (SD 6.4) and in the Schizophrenia group it was 24.7 years (S.D. 6.9) while the mean duration of illness was 5.25 years (S.D. 3.6) and 6.53 years (S.D. 4.8) respectively which was comparable p= 0.977; 0.282. The demographic profile for caregivers of schizophrenia and BPAD patients showed no difference.

Sl. No.	Parameter	Attributes	BPAD	Schizophrenia	Test of Significance	dF	p-value
1.	Sex	Male	22 (36%)	28 (46%)	0.86	1	0.35
		Female	38 (64%)	32 (54%)			
2.	Education	Illiterate	5 (8%)	13 (22%)	4.84	3	0.18
		Primary School	13 (22%)	11 (18%)			
		Secondary School	26 (44%)	19 (32%)			
		Grad/PG/Prof.	16 (26%)	17 (28%)			
3.	Working Status	Working	34 (56%)	34 (56%)	0.79	2	0.67
		Non-working	10 (16%)	7 (12%)			
		House wife	16 (28%)	19 (32%)			
4.	Acceptance level	Good	31 (52%)	19 (32%)	5.4	2	0.07
		Moderate	22 (36%)	28 (46%)			
		Poor	7 (12%)	13 (22%)			
5.	Relationship with subject	Spouse	23 (38%)	19 (32%)	1.7	3	0.63
		Parent	19 (32%)	25 (42%)			
		Sibling	12 (20%)	9 (14%)			
		Others*	6 (10%)	7 (12%)			
6.	Age (Yrs.)	Mean ± SD	45.2 ± 15.11	43.41 ±13.3	0.521	118	0.732

Table 2. The Sociodemographic Profile of Care Givers

Cost of Illness- Only those patients who had incurred losses were included for comparison. Mean Lifetime costs in BPAD patients is Rs. 27,905 and Rs. 50,325 in schizophrenia group. Loss of income in the past year was Rs. 33,635 in BPAD and Rs. 29,836 in schizophrenia. The mean loss of income over the lifetime in subjects with Bipolar Affective Disorder was Rs. 90,922 and in Schizophrenia was Rs. 2,10,345. Wilcoxson signed rank analysis showed a significant difference between the two groups. (z-value -3.05 and p=0.004.) The mean cost of Medicine was found out to be Rs. 2,456 in BPAD & Rs. 1,936.8 in schizophrenia group. Rank analysis show a significant difference between groups. (Z-value was -3.172 and p-value 0.002). The mean cost of current medicines being subsidized by IMH was Rs. 1,263.52 in BPAD and Rs. 894.25 for schizophrenia respectively. The mean rank in the Bipolar Affective Disorder group was 70.59 & the difference was highly significant (z-value was -0.316 & p-value 0.002). Significant difference was found between mean transport cost of Bipolar Affective Disorder group (Rs. 3,548.55) and Rs. 1,762.70 by Schizophrenia group.

Sl. No.	Parameter	No. of Subjects		Mean Rank		Sum of Ranks		Z value	P Value
		Bipolar Affective Disorder	Schizophrenia	Bipolar Affective Disorder	Schizophrenia	Bipolar Affective Disorder	Schizophrenia		
1.	Total money spent on treatment over the lifetime (Rs.)	60	60	53.69	67.31	3221.71	4038.29	-2.02	0.05
2.	Cost of hospitalization over the lifetime (Rs.)	10*	14*	11.21	12.78	123.68	176.32	-0.55	0.574

3.	Cost of private consultation over the lifetime (Rs.)	48*	50*	39.7	65.2	1786.36	3778.59	-2.826	0.004
4.	Cost of faith healer / alternative Rx over the lifetime (Rs.)	36*	42*	35.31	43.38	1310.49	1770.5	-1.68	0.1
5.	Cost of investigation over the lifetime (Rs.)	15*	8*	10.54	12.71	173.5	102.49	-0.72	0.452
6.	Monetary losses over the lifetime (Rs.)	7*	5*	5.65	6.34	46.58	31.41	-0.24	0.86
7.	Loss of income over the lifetime (Rs.)	23*	30*	20.04	32.95	459.35	971.64	-3.05	0.004
8.	Cost of current medicines (per annum) (Rs.)	60	60	70.84	49.15	4286.27	2973.7	-3.17	0.002
9.	Cost of current medicines subsidized by IMH (per annum) (Rs.)	60	60	70.59	49.41	4018.15	3241.84	-3.16	0.002
10.	Cost of current transport (per annum) (Rs.)	60	60	69.77	50.23	4054.8	3205.18	-2.41	0.012
11.	Loss of income in the past year (Rs.)	25*	32*	27.25	29.74	790.38	862.61	-1.51	0.235

Table 3. Comparison of Cost of Illness of Bipolar Affective Disorder and Schizophrenia

Sl. No.	Domain	Severity of Burden	BPAD	Schizophrenia	T Test	dF	p-value
A	Financial Burden	No Burden	8 (14%)	13 (22%)	6.86	2	0.03*
		Moderate Burden	31 (52%)	17 (28%)			
		Severe Burden	21 (34%)	30 (50%)			
B	Disruption of Routine Family Activities	No Burden	11 (18%)	11 (18%)	2.05	2	0.35
		Moderate Burden	25 (42%)	32 (54%)			
		Severe Burden	24 (40%)	17 (28%)			
C	Disruption of Family Leisure	No Burden	14 (24%)	13 (22%)	0.31	2	0.85
		Moderate Burden	23 (38%)	26 (44%)			
		Severe Burden	23 (38%)	21 (34%)			
D	Disruption of Family Interaction	No Burden	6 (10%)	6 (10%)	0.04	2	0.98
		Moderate Burden	26 (44%)	25 (42%)			
		Severe Burden	28 (48%)	29 (48%)			
E	Effect on Physical Health of Family members	No Burden	55 (92%)	54 (90%)	0.34	2	0.84
		Moderate Burden	4 (6%)	4 (6%)			
		Severe Burden	1 (2%)	2 (4%)			
F	Effect on Mental Health of Family members	No Burden	26 (44%)	29 (48%)	0.5	2	0.78
		Moderate Burden	15 (24%)	12 (20%)			
		Severe Burden	19 (32%)	19 (32%)			
G	Subjective Burden	No Burden	10 (16%)	11 (18%)	1.32	2	0.516
		Moderate Burden	25 (42%)	19 (32%)			
		Severe Burden	25 (42%)	30 (50%)			

Global Objective Burden (sum of A-F)	Mean ± SD	5.72 (2.11)	5.54 (2.53)	0.079	118	0.846

Table 4. Burden Experienced by the Caregivers of Schizophrenia and Bipolar Group

8 (14%) of caregivers of subjects with Bipolar Affective Disorder did not experience any financial burden and 31 (52%) of caregivers experienced moderate and 21 (34%) of caregivers experienced severe financial burden. 13 (22%) of caregivers of schizophrenics experienced no financial burden, 17 (28%) experienced moderate and 30 (50%) experienced severe burden. 49 (82%) caregivers of Bipolar Affective Disorder subjects, experienced moderate to severe disruption and 49 (82%) caregivers of schizophrenia experienced moderate to severe disruption and are comparable (P value=0.35).

Care givers of 46 BPAD and 47 schizophrenia patients experienced disruption in family leisure activities from moderate 23 (38%), 26 (44%) to severe (23 (38%), 21 (34%). Majority of caregivers 54 (90%) of both BPAD and schizophrenia patients had disruption of family interaction and were comparable statistically. The physical health was not affected in majority of caregivers-92% and 90% respectively in BPAD and Schizophrenia groups and the difference was not statistically significant (p value = 0.84). 24 caregivers of BPAD (67%) and 31 caregivers (52%) of schizophrenia reported mental health effects and the two groups have comparable burden (p value = 0.78). 25 (42%) of BPAD caregivers reported moderate and 25 (42%) reported severe subjective burden. In the Schizophrenia group, 19 (32%) reported moderate and 30 (50%) reported severe subjective burden, with no statistical difference (Pearson's Chi square test value 1.32; p=0.516). The mean global objective burden experienced in Bipolar Affective Disorder group was 5.72 (SD-2.11), that of schizophrenia group was 5.54 (SD-2.53), making the two groups comparable (p value=0.846).

DISCUSSION

The mean age of subjects in Bipolar Affective Disorder group was 33.32 years which was comparable to the mean age of subjects (35.72 years ± 7.32) in the study by Chakrabarti et al (1995).[18] This high mean age at first therapeutic contact at IMH supports the long duration of illness of tertiary care psychiatric centers (5.25 years ± 3.16 in current study). The males were almost twice as high as females reasons being cultural issues and stigma.

66% of the subjects were married, 28% were single and only 6% were either divorced/widowed/separated. The higher rates of marriage can be explained by South Asian ethos wherein marriage is a social norm and divorce is not very common. Only 16% of Bipolar Affective Disorder subjects and 12% of Schizophrenia subjects were illiterate. Only 24% of the subjects in our study were unemployed, and this can be attributed to the ready availability of unskilled labour and 54% of the schizophrenics were unemployed explained due disease severity of schizophrenia. The Bipolar Affective Disorder patients traveled significantly more distance to reach the hospital as compared to Schizophrenia patients (Chi square = 12.27; p = 0.045) as most Schizophrenia patients came from nearby urban areas while greater number of Bipolar Affective Disorder subjects came from distant rural areas (Chi square = 4.66; p = 0.03). 52% in Bipolar Affective Disorder group and 58% in Schizophrenia group had a family income of less than Rs. 25,000 indicating the Institute is catering mostly to the low socioeconomic strata. The mean duration of illness was similar (5.25 years (S.D. 3.16)) in Bipolar Affective Disorder group and 6.53 years (S.D. 4.79) in Schizophrenia group which is comparatively more than that in Roy Chaudhuri et al as this institution also has custodial care setup. In the demographic profile of caregivers, the mean age corresponds to Chakrabarti et al (1995)[18] which is 39.77± 13.01 years (our study 44.3 years). The majority of caregivers in both the groups were females (64% in Bipolar Affective Disorder group and 54% in Schizophrenia). This is similar to other studies by Chakrabarti et al (1995),[18] Perlick et al (1999),[21] Dore and Romans (2001).[22] Spouses and parents are in comparable proportion in taking care of patients due to joint family culture regardless of their marital status in contrast to western studies where spouse were more involved. The acceptance level of the patient's illness was more with BPAD than with schizophrenia due to the periods of remission.

Cost of illness observations shows that the Schizophrenia group had spent significantly more money on treatment over the lifetime as compared to Bipolar Affective Disorder group (Rs. 50,325 and Rs. 27,905, p value-0.05). The difference could possibly also due to that the BPAD patients had taken treatment only during episodes and recall bias in the caregivers as it is not a continuous treatment.

Lifetime Costs- The difference in the total amount and that on private consultation spent between the two groups is statistically significant. Approximately 40% of the subjects had suffered loss of income due to illness in the lifetime. The mean loss of income was Rs. 90,922 with standard deviation of 123813 in Bipolar Affective Disorder group. The mean loss of income was Rs. 21,0345 with standard deviation of 415723 in the Schizophrenia group. The difference between the two groups was highly significant with Z value -3.050 and p=0.004.

Current Cost- The indirect cost is the higher contributor as medicines are given free of cost in IMH. Still the difference was found to be significantly higher in BPAD group z value -3.16 and p value 0.002. The cost of transport was significantly higher in BPAD patients than in schizophrenics (mean cost of BPAD =Rs. 3,548.55, schizophrenia =Rs. 1,272.60 z-value = -2.413 & p=0.012.) correlating with the urban residence of patients in our study population. The mean loss of income in the past one year did not show any significant difference between both groups as Z value was found to be – 1.51 and p value 0.23. Taking the prevalence of Bipolar Affective disorder to be 0.9 to 1.3% (as per Rihmer

and Angst)[23] and the population of India asper 2001 Census 1,027,015,247.[24] the number of subjects with Bipolar Affective disorder in India is likely to be about 1 million (1.02 million) and the total cost of illness of Bipolar Affective disorder on the basis of our study is 39.6 billion. A systematic review found the cost of illness of BPAD calculated as purchasing power parity in US$ ranged from 4,500 to 15,000 US$.[25] This implicated the cost of illness of BPAD is high. The total current cost of illness including direct and indirect cost in case of subjects with Schizophrenia was determined to be Rs 32,535.7 per person per year. Taking the prevalence of Schizophrenia to be 2.7 per 1000 population as per Venkatswamy Reddy and Chandrashekhar[26] and the population figures of India according to the 2001 Census as 1,027,015,247[24] the number of subjects with Schizophrenia in India is likely to be nearly 2.8 million (2772941). The total cost of illness of Schizophrenia on the basis of our study is Rs. 91.1 billion this coincides with cost of illness in the U.S which ranges from 94 million US$ to 102 billion US$.[27] Mean cost of a clinic visit in Colombo was found to be Rs. 500 including direct and indirect costs.[28]

Family Burden- Our study findings correspond to the findings of other studies that caregivers face significant and severe financial burden. The burden was significantly more in schizophrenia because of the continuous nature of illness of several years on an average, with resultant loss of skills and employment opportunities, and the urban residence where cost of living is comparatively high and the nuclear family setup with single earning member. The BPAD patients, are more from rural area, joint family and inter episodic occupations by the patient possible. In Disruption of routine family activities and family leisure both the groups experienced similar burden. The relatively lower burden in this domain could be because family leisure is not a priority area for most Indian families because of the family centric nature of Indian psyche where family duty is considered far above individual needs. Our study confirms to the Dore and Romans' study findings[23] the adverse impact on family interaction amongst the caregivers of subjects with Bipolar Affective Disorder possibly due to stigma for psychiatric illness. The impact on physical health of caregivers in is not a problem in patients treated as OPD treatment is more in the study sample.

84% respondents in BPAD and 82% in schizophrenia group reported significant mental health burden from moderate to severe. Thus, the care givers in both Bipolar Affective Disorder and Schizophrenia groups was associated with significant mental morbidity as poor sleep, feeling low or irritable. In Bipolar Affective Disorder group 16% reported no subjective burden, 42% reported moderate and 42% severe burden while in Schizophrenia group 18% reported no burden, 32% reported moderate and 50% severe subjective burden (p=0.516). Our study reflects the findings of earlier studies in that the majority of the care givers experience moderate to severe subjective burden. Comparing the objective burden both groups reported similar burden (5.72 (S.D. 2.11)) in Bipolar Affective Disorder group and 5.54 (S.D. 2.53) in Schizophrenia group (t-test value 0.079, p=0.846). According to our study, the burden of Bipolar Affective Disorder is comparable to that of Schizophrenia. Though some caregivers reported no burden in some individual domains, they did experience significant burden in other domains. In a study by Vasudev et al[29] schizophrenia caregivers had more burden than BPAD patient caregivers, the difference could possibly be because they had used burden assessment schedule for assessing caregiver burden.

Limitations- The fact that this was a hospital-based study and that the sample size was less is limitation. The questionnaire used to analyse the cost of illness and burden was not validated for this population. Recall bias could be present in the estimation of lifetime illness costs. The caregiver accompanying the patient was taken in the study, if the primary caregiver is different, it would have altered the results. Nature of patients attending IMH – their chronicity limits the generalization of the research finding.

CONCLUSION

The burden of both the disorders was comparable in all the domains except financial burden which was more in case of Schizophrenia. Future studies may be directed to accurately assess the burden of BPAD at community and the development of validated measures in assessing cost of illness and burden.

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