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Research Paper

Correlation between Sleep Disturbance and Clinico-Socio Demographic Variables in a Cohort of Depressive Patients

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ABSTRACT

Objective: To study the correlation of insomnia with the socio demographic and clinical variables in a cohort of depressed patients. ***Method:*** A cross-sectional study of a cohort of 30 outpatient sample with non psychotic depression were recruited for the study. Controls were the accompanying relatives of the patients. Study was conducted at a government hospital in Tamil Nadu, South India. Study group was selected by including patients who fulfilled ICD 10 criteria for major depressive disorder. Patients who were 18yrs of age and above and both male and female genders were included in the study. Both study and control groups were administered the Pittsburg Sleep Quality Index (PSQI) to measure the characteristics of sleep disturbances in the sample. Differences between cases and controls on socio demographic variables were analyzed using Chi-square test. ***Results:*** The prevalence of sleep disturbances were more in the depressed people (93.3%) than in the control group (13.3%) which was statistically significant (p = 0.001). There was also statistically significant positive association between nightmare symptoms and suicide attempts in the depressed group (p = 0.003). ***Conclusions:*** Study shows that among depressed people, there is significant correlation between the severity of sleep disturbances especially with nightmare symptoms and suicide attempt.

Keywords: *Severity Of Depression, Quality Of Sleep.*

Insomnia is present in approximately 10.16% of general population but is much more common in depression (up-to 90%). Complaints of sleep disruptions are common preceding and during major depressive episode.[(1)(2)] At least 65% of major depressive disorder patients report at least some form of sleep disturbance (initial, middle or terminal insomnia).[(3)] Population surveys indicate that adults who have insomnia are upto 9 times more likely to

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have major depression at the time of interview than those who do not have insomnia.[4] Young adults who have a history of insomnia, hypersomnia or both show a 10-20 fold increase in lifetime prevalence of major depression. Moreover, major depression combined with insomnia confers an increased risk for suicide in adolescents and adults.[5][6]

Reason for study

Insomnia is the residual symptom reported most commonly in remitted major depression. Persistence of sleep disturbances is shown predictive of increased severity and recurrence of major depression.[7] In view of this special relationship and paucity of Indian literature, in this study an attempt is made to find any correlation between sleep disturbances and clinical and socio demographic factors in patients with depression compared to normal controls.

Aim of the study

- To study correlation between sleep disturbance and clinico-socio demographic variables in a cohort of depressive patients

Objective

1. To study the correlation between sleep disturbance and socio demographic variables in a cohort of depressive patients.
2. To study the correlation between sleep disturbance and clinical variables like severity of depression, type of depression, duration of illness, number of episodes and suicidal attempts in the cohort.
3. To study the correlation between nightmares and suicidal attempt.

METHODOLOGY

We studied a cross-sectional sample of outpatients with depressive disorder. Convenient sampling was done of patients attending the psychiatry out-patient department at a Government Medical College Hospital in Tamil Nadu. Study group consisted of 30 patients who fulfilled the ICD-10 diagnostic criteria for depressive disorder. Control group consisted of 30 individuals who were the family members accompanying the psychiatric patients at the out-patient department. The study period was 6 months from 1 st March 2007 to 31 August 2007.

Inclusion & exclusion criteria:

Inclusion criteria consisted of patients aged 18 years and above with ICD-10 diagnosis of depression who were drug naive (anti-depressants, mood-stabilizers and sedative-hypnotics) for a minimum period of 12 weeks. Patients with psychotic features or depressive stupor and other co-morbid psychiatric illness and substance use disorders like alcohol, tobacco etc were excluded from the study. For the controls the accompanying relative of the psychiatric patients with no ICD 10 diagnosis of any psychiatric illness were selected as controls. The study protocol was approved by the Ethics committee of the Govt. Medical College.

Scales used

Convenient random sampling of patients attending the outpatient department was done. Data on socio demographic and clinical variables was collected using a semi structured data collection profoma. The patients diagnosed with depressive disorder using ICD 10 criteria were administered Hamilton Rating Scale for Depression - 17 item version for rating severity of depression. The Pittsburg sleep quality index scale (PSQI) is a self-rated questionnaire developed in late 1980s which specifically measures sleep quality in clinical populations. It assesses sleep quality and disturbances over a 1-month time interval. A global PSQI score greater than 5 yields a diagnostic sensitivity of 89.6% and specificity of 86.5% in distinguishing good and poor sleepers. The acceptable measures of internal homogeneity, consistency and validity of PSQI makes it the most widely used questionnaire for psychiatric clinical practice and research activities related to sleep. Global PSQI score of 6 to 14 indicates moderate sleep disturbances; 15 and above severe sleep disturbances. [8]

Statistical methods

Differences between cases and controls on socio demographic variables were analyzed using Chi-square test. Prevalence of sleep disturbances are given in proportion with 95% confidence intervals. Association between depression and demographic variables are analyzed using student 't-test' and one way ANOVA 'F-test'. P value less than 0.05 is taken as significant.

RESULTS

(i) Socio-demographic and clinical variables

Among clinical and socio-demographic variables there is no statistically significant difference between cases and controls except for the suicide attempts variable. Among cases 20% had attempted suicide during the current episode of depression and 6.7% had past history of suicide attempts and there were no suicide attempts in the control group.

Table 1.Clinical and socio-demographic characteristics of cases and controls

		Group				
		Case		Control		
		N	%	n	%	Significance
Age	18-39 yrs	21	70.0%	15	50.0%	χ^2=2.80
	40-59 yrs	7	23.3%	13	43.3%	p=0.28
	60 & above	2	6.7%	2	6.7%	Not significant
Sex	Male	11	36.7%	15	50.0%	χ^2=1.08
	Female	19	63.3%	15	50.0%	p=0.29 Not significant
Education	Illiterate	4	13.3%	3	10.0%	χ^2=1.27
	Primary	9	30.0%	8	26.7%	p=0.74
	High school	12	40.0%	16	53.3%	Not significant
	UG& others	5	16.7%	3	10.0%	
Marital Status	Married	23	76.7%	26	86.7%	χ^2=1.98
	Unmarried	4	13.3%	1	3.3%	

		Group				
		Case		Control		
		N	%	n	%	Significance
	Widowed/Divorced/Separated	3	10.0%	3	10.0%	p=0.37 Not significant
Occupation	Employed	17	56.7%	22	73.3%	$\chi 2$=1.83
	Unemployed	13	43.3%	8	26.7%	p=0.18 Not significant
Monthly Income	<Rs.1500	2	6.7%	1	3.3%	$\chi 2$=0.35
	Rs.1500-5000	25	83.3%	26	86.7%	p=0.83
	>Rs.5000	3	10.0%	3	10.0%	Not significant
Family System	Nuclear	22	73.3%	18	60.0%	$\chi 2$=2.40
	Joint	6	20.0%	6	20.0%	p=0.30
	Extended	2	6.7%	6	20.0%	Not significant
Domicile	Urban	25	83.3%	23	76.7%	$\chi 2$=0.42
	Rural	5	16.7%	7	23.3%	p=0.52 Not significant
Suicide Attempts	Nil	22	73.3%	30	100.0%	**$\chi 2$=9.23**
	Attempted suicide	6	20.0%			**p=0.01**
	Past h/o suicide attempts	2	6.7%			**Significant**

(ii) Severity of depression and sleep disturbances in the sample

Among the cases, 10% were mildly depressed, 23.3% moderately depressed and 66.7% were severely depressed. Thus majority of cases were having depression with severity of moderate to severe type. The prevalence of sleep disturbances were more in the depressed people (93.3%) than in the control group (13.3%) which was statistically significant with 95% confidence interval (Table 2). The mean global PSQI score among depressed group was 12.43 which was considerably higher than that of control group for which the mean score was 3.0. For this difference the student 't' test showed 'p' value of 0.001 which was highly significant. Thus the severity of sleep disturbances is higher in the depressed people (cases) than in the control group. (Table 3)

Table 2. Prevalence of sleep disturbances

		GROUP			
		Case		Control	
		n	%	n	%
Sleep disturbances	Nil	2	6.7%	26	86.7%
	Moderate	16	53.3%	4	13.3%
	Severe	12	40.0%	-	-

χ^2 = 39.77 P = 0.001

Table 3. Mean global PSQI score among cases and controls

	N	Mean	Std. Deviation	Significance
Case	30	12.43	3.52	**t = 12.05**
Control	30	3	2.45	**p = 0.001**

(iii) <u>Association between severity of sleep disturbances and clinico-socio demographic variables</u>

On analyzing the association between the global mean PSQI score for sleep disturbances and various clinico-socio-demographic variables among the depressed group, there was no statistically significant difference within all the variables except for the occupation. Within the occupational variable, there was highly significant statistical difference between employed and unemployed group in the mean Global PSQI score with unemployed group scoring higher (14.69) than employed group (10.71) with 'p' value of 0.001. This shows that among the depressed (cases), the unemployed people had more severe sleep disturbances than the employed group.(Table 4) Also when analyzing severity of depression, the mean HAM-D_{17} score among unemployed (25.31) was considerably higher than that of employed (20.06) which was statistically significant with 'p' value of 0.04.

Table 4. Association between mean PSQI scores and clinico-socio demographic variables among depressed (Cases)

		n	Mean PSQI score	SD	Significance
Age	18-39 yrs	21	11.90	3.97	F=0.85
	40-59 yrs	7	13.43	1.90	p=0.44
	60 & above	2	14.50	.71	Not significant
Sex	Male	11	11.73	3.93	t=0.83
	Female	19	12.84	3.30	p=0.41 Not significant
Education	Illiterate	4	12.75	2.06	F=0.22
	Primary	9	12.22	2.73	p=0.88
	High school	12	12.92	3.96	Not significant
	UG& others	5	11.40	5.13	
Marital Status	Married	23	13.00	2.78	F=1.30
	Unmarried	4	10.50	5.45	p=0.28
	Widowed/Divorced/Separated	3	10.67	5.86	Not significant
Occupation	Employed	17	10.71	3.74	**t=3.67**
	Unemployed	13	14.69	1.25	**p=0.001 Significant**
Monthly Income	<Rs.1500	2	12.50	2.12	F=0.15
	Rs.1500-5000	25	12.56	3.36	p=0.85
	>Rs.5000	3	11.33	6.35	Not significant
Family System	Nuclear	22	12.05	3.72	F=0.72
	Joint	6	13.00	3.16	p=0.49
	Extended	2	15.00	.00	Not significant

		n	Mean PSQI score	SD	Significance
Domicile	Urban	25	12.16	3.74	t=0.90
	Rural	5	13.80	1.79	p=0.35 Not significant
Duration of Illness	1-3month	10	9.00	4.36	F=0.51
	3-6month	11	11.33	3.44	p=0.61
	>6months	9	13.33	3.36	Not significant
No.of Episodes	First episode	28	12.67	2.52	F=0.19
	More than one episode	2	12.40	4.01	p=0.66 Not significant
Suicide Attempts	Nil	22	11.91	3.82	F=1.05
	Attempted suicide	6	13.50	2.35	p=0.36
	Past h/o suicide attempts	2	15.00	0.00	Not significant
Diagnosis	Mild	3	9.00	4.359	F=1.64 p=0.20 Not significant
	Moderate	6	11.33	3.445	
	Severe	18	13.33	3.361	
	Dysthymia	3	12.67	2.517	

(iv) Correlation between sleep disturbances and suicide in depression

The mean Global PSQI score among suicide attempters (13.50) and those with past history of suicide attempts (15.00) was higher than that of non-attempters (11.91) but this was not statistically significant (Table 5). Among the depressed group (cases), 6 had attempted suicide during the current episode of depression, 2 had past history of suicide attempts and 22 were non-attempters. Among the current suicide attempters, 33.3% had moderate nightmare symptoms, 50% had severe nightmare symptoms, 16.7% had no nightmare symptoms in the PSQI subscale. Among past suicide attempters, none had nightmare symptoms during the current episode of depression. Among non-attempters, 4.5% had mild and 4.5% had moderate nightmare symptoms and 91% had no nightmare symptoms at all. The difference was statistically significant with 'p' value of 0.003 which shows that there is significant positive association between nightmare symptoms and suicide attempts in depressed group (Table 6).

Table 5. Association between sleep disturbances and suicide attempts among depressed (cases)

		N	Global PSQI score		One way ANOVA
			Mean	Std. Deviation	
Suicide attempts	Nil	22	11.91	3.816	F = 1.05 p = 0.36
	Attempted suicide	6	13.50	2.345	
	Past h/o suicide attempts	2	15.00	0.000	
	Total	30	12.43	3.520	

Table 6. Association between nightmare symptom and suicide attempts in depressed (cases)

		SUICIDE ATTEMPTS					
		Nil		Attempted suicide		Past H/o suicide attempts	
		n	%	n	%	n	%
Nightmare symptom score in PSQI	0	20	90.9%	1	16.7%	2	100%
	1	1	4.5%	-	-	-	-
	2	1	4.5%	2	33.3%	-	-
	3	-	-	3	50.0%	-	-

χ^2 = 20.02 p = 0.003 Significant

(v) Sleep disturbances in elderly depressed

Among cases, 90.5% of those in the 18-39 yrs age group had moderate to severe sleep disturbances. But the prevalence of sleep disturbance was 100 % in people in the age group of 40 years and above. The mean global PSQI score was increasing as age advances with highest score of 14.50 in the elderly age group (≥ 60 years). But the difference was not statistically significant.(Tables 7,8)

Table 7. Severity of sleep disturbances across various age groups

		AGE (in years)					
		18-39		40-59		60 & above	
		n	%	N	%	n	%
Sleep disturbances	Nil	2	9.5%	-	-	-	-
	Moderate	11	52.4%	4	57.1%	1	50%
	Severe	8	38.1%	3	42.9%	1	50%

χ^2 = 0.97 p = 0.92 Not Significant

Table 8. Mean global-PSQI score among various age groups

		n	Global PSQI score		Significance
			Mean	Std. Deviation	
Age (in years)	18-39	21	11.90	3.97	F = 0.85
	40-59	7	13.43	1.90	p = 0.44
	60 & above	2	14.50	0.71	Not Significant

(vi) Sleep disturbances in depressed women

Even though there was no statistically significant difference between depressed males and females in the prevalence of sleep disturbances, depressed women had slightly higher prevalence of 94.7% whereas the men had a prevalence rate of 91%. The mean global PSQI score was also higher in women (12.84) than in men (11.73) but these differences were not statistically significant. (Tables 9,10)

Table 9. Prevalence of sleep disturbances in depressed women

		SEX			
		Male		Female	
		n	%	%	n
Sleep disturbances	Nil	1	9.1%	1	5.3%
	Moderate	5	45.5%	11	57.9%
	Severe	5	45.5%	7	36.8%

$\chi^2 = 0.48$ p = 0.78 Not Significant

Table 10. Mean global PSQI score among depressed women

		n	Global PSQI score		Significance
			Mean	Std. Deviation	
Sex	Male	11	11.73	3.93	t = 0.83
	Female	19	12.84	3.30	p = 0.41 Not significant

DISCUSSION

The cases and controls were well matched for socio demographic variables and when comparing clinical variables it was evident that 26.7% of the cases had history of suicidal attempt. Whereas though sleep disturbances were present in the control group, there were nil suicidal attempts in the control group. Thus prevalence of sleep disturbance alone may not be correlated with suicidal behavior, whereas when we analyzed the severity of sleep disturbances in the depressed group, the prevalence as well as severity of the sleep disturbance was significantly higher in the depressed group. Our results conform with other studies which give prevalence rates ranging from 60 to 90%. Thase ME (1991)[(9)] reports a prevalence of 90% where as Perlis ML and Buysse DJ et al, (1997)[(10)] gives a prevalence of 60%. Liu X, Buysse DJ et al, (2007)[(11)] reports a prevalence of 72.7% in depressed children and adolescents.

Another significant finding was that compared to those without history of suicide attempts, 83.3% of the suicide attempters had nightmare symptoms in the PSQI subscale and this was statistically significant (p=0.003). This finding is similar to that of another *cross-sectional naturalistic study of 52 inpatients, that had shown that depressed patients suffering from nightmares had increased suicidal risk.*[(12)] Studies show that nightmares are associated with suicide risk and that they predict suicide variance that is unique from other suicide risk factors, such as depression, anxiety, PTSD, and substance use disorders.[(13)]

When comparing the correlation between severity of sleep disturbances and socio demographic variables, we found significant correlation with employment status, that is both severity of sleep disturbances as well as severity of depression was significantly higher among the unemployed. But this again could be explained by the debilitating condition of major depressive disorder which could have contributed to the occupational dysfunction in these patients thus causing unemployment.

Studies show that the prevalence of insomnia diagnoses is stable between 15 and 44 years and from 45 years of age it increases but the prevalence remains the same in elderly individuals.[14]

Our study found that the prevalence of sleep disturbance was 100 % in people in the age group of 40 years and above. And the severity of sleep disturbance was the most severe in the elderly age group (≥ 60 years). But this difference was not statistically significant. The severity of sleep disturbances needs to be assessed with larger sample to identify the dysfunction secondary to insomnia.

Regarding gender there was a marginally higher prevalence and severity of sleep disturbances among the female gender compared to the males, but this was not statistically significant. It is shown in various studies that women report insomnia symptoms more commonly than males.[15][16]

A systematic review had shown that the ratio of women to men for insomnia symptoms was 1.4 and this increased to 1.7 after age of 45 yrs.[17] Some studies have shown that menopausal women have more complaints of insomnia than their younger counterparts.[18][19] But there are studies showing that the underlying chronic medical conditions are more related to insomnia symptoms rather than menopause.[20]

POSITIVES AND LIMITATIONS

Positives of the study was that we had used validated criteria and standardized scales like for the subjects recruited according to the ICD 10 classificatory criteria for psychiatric disorders and for assessment of depression severity we used $HAMD_{17}$ and for quality of sleep we used the PSQI scale. By having a matched control group we were able to carry out a meaningful comparison among the variables. Study on the correlation between sleep disturbances and the various clinico-socio demographic variables especially suicidal risk in depressed patients throws light on the importance of management of insomnia and looking for risk factors for insomnia in treatment of depression.

Limitations due to cross-sectional nature of the study apply here. Follow-up study with treatment of depression would give temporal correlation of changes in sleep disturbance as depression remits. Bipolar depression cases were not included in this study which needs further exploration for any difference in sleep disturbances between unipolar and bipolar depression which was beyond scope of this study.

CONCLUSION

The prevalence and severity of sleep disturbances are significantly higher in depressed people than in the non-depressed population. Sleep disturbance alone may not be strong predictor for suicidal risk but presence of both depressive symptoms and insomnia is correlated with

higher suicidal risk. Among depressed people, suicide attempt is significantly high when there are associated nightmare symptoms.

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