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Study of Psychiatric Morbidity Among the Survivors of Cerebrovascular Stroke at a Tertiary Care Centre

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Abstract

Introduction: According to World Health Organization (WHO), cerebrovascular stroke is the second leading cause of death and disability all over the world. Infarct alters brain function which leads to neuropsychiatric sequela. Psychiatric morbidities are common in stroke-survivor cohorts and are associated with increased morbidity and mortality. **Aims and Objectives:** The present study was conducted in a tertiary care hospital to understand the different psychiatric morbidities in patients with cerebrovascular accidents (stroke). **Material and Methods:** 150 stroke survivors were included in the study after they satisfied the eligibility criteria. Mini International Neuropsychiatric Interview (MINI) 7.0.0 was applied to diagnose the psychiatric illness in the patients. **Results:** Out of 150 patients 79 patients (52.66%) had psychiatric illness. Out of the 150 patients, 50 patients (33.33%) had Major Depressive Disorder, 24 patients (16%) had Generalized Anxiety Disorder (GAD), 3 patients (2%) were diagnosed with psychotic disorder whereas 2 Patients (1.33%) had social phobia. Out of which 50 patients (33.33%) were having Major Depressive Disorder (MDD), 24 patients (16%) were having Generalized Anxiety Disorder, 3 patients (2%) were having psychotic disorder and 2 Patients (1.33%) were having Social phobia. Most of the patients had ischemic type of stroke (133 patients) , left sided lesion (88 patients) being the most common. **Conclusion:** Major depressive disorder was the most common psychiatric illness followed by generalized anxiety disorder. The psychiatric illness was not associated with type of stroke and side of lesion.

Keywords: Cerebrovascular Stroke, Generalized Anxiety Disorder, Major Depressive Disorder, Social Phobia

1. Introduction

According to WHO, cerebrovascular stroke is the second leading cause of disability and death all over the world. By the end of 2050, almost 80% of stroke in the world would be reported from middle- or low-income group countries[1]. In last one and half decade there is an increase of 17.5% in stroke cases in India[2,3].

There are two main types of stroke - ischemic and hemorrhagic stroke. Ischemic stroke (85%) is more common among the two; with the most common artery involved being the middle cerebral artery. Left sided ischemic stroke is the more common type of stroke globally[4]. Infarct alters brain function which leads to neuropsychiatric sequela. Mood disorders (depression) are common in stroke-survivor cohorts and are associated with increased morbidity and mortality. Meta-analysis of point-prevalence rates suggest one third of stroke-survivors develop post-stroke depression[5,6]. More than half of stroke survivors will be affected by depression at some point[7].

Other common psychiatric disorders are anxiety disorders. Common type of anxiety disorders are generalized anxiety disorder, social phobia and anxiety with co-morbid depression[8]. Anxiety can be potentially serious and disabling with manifold adverse consequences on a patient's daily functioning interpersonal relationships, and quality of life[9].

Our study was conducted in a tertiary care hospital to understand the different psychiatric morbidities in patients with cerebrovascular accidents in the rural and urban mix set up in present day.

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2. Aims and Objectives

To study the psychiatric morbidities among patients with cerebrovascular stroke.

3. Material and Methods

Study Type/ Design: Cross sectional observational study.
Study Settings: The study was conducted in the Department of Psychiatry and Neuropsychiatry Clinic in a tertiary care institute.
Duration of Study: August 2017 to December 2019
Sample Size: Minimum no. of patients = 150
$n=z^{2}*p*q/d^{2}$
z=1.96 p=11% q=(100-11) d=5%

3.1 Eligibility Criteria

1. No history of past psychiatry illness.
2. Age of patients is between 18 to 60 years.

All the patients enrolled in the study are given mental health advice and treatment accordingly.

3.2 Data Collection Tools

The following materials were used for assessment of study subjects.

1. A semi structured proforma was prepared to collect data regarding demographic details
2. All the study participants were screened for psychiatric morbidity by using MINI version 7.0.0 (Mini International Neuropsychiatric Interview)[10].
3. MMSE-Mini Mental Status Examination[8].

4. Results

Present study was done to assess the psychiatric morbidities in post stroke survivors. Total 150 patients were included in the study.

Table 1 shows psychiatric morbidity among stroke survivors. In them most common psychiatric illness was MDD (33%), followed by GAD (16%), Psychotic disorder (2%) and social phobia (1.33%). Among the study population 47.33% did not have any psychiatric illness.

In the present study psychiatric illness in post stroke survivors was not associated with age. As seen in table 2 the most common age group is more than 50 yr (72), followed by 36-50 years (60) and 20-25 years (18). Most common psychiatric illness in our study group was MDD (50), followed by GAD (24), psychotic disorder (3) and social phobia (2).

Table 1. Psychiatric morbidity among stroke survivors

	FREQUENCY (%)
1. MAJOR DEPRESSIVE DISORDER(MDD)	50(33%)
2. GENERALIZED ANXIETY DISORDER(GAD)	24(16%)
3. SOCIAL PHOBIA	2(1.33%)
4. PSYCHOTIC DISORDER	3(2%)
5. ABSENT	71(47.33%)
TOTAL	**150**

We found that psychiatric illness in post stroke survivors was not associated with sex.108 people were male and 42 were female. In males, MDD was the most common (33) followed by generalized anxiety disorder (17), psychotic disorder (3) and social phobia (2).

We found in the present study psychiatric illness in post stroke survivors was significantly associated with occupation (p value=0.07). Out of the 150 patients, 88 were farmers, 25 were unemployed, 24 were service-men and the rest 13 were business-men.

Psychiatric illness in post stroke survivors was not significantly associated with religion. 141 patients in this study were Hindus, 8 were Muslims and 1 patient was Christian. Amongst the patients who were Hindus, the most common psychiatric illness was MDD (49), Followed by Generalized anxiety disorder (20), psychotic disorder (3) and social phobia (2).

In the present study psychiatric illness in post stroke survivors was not significantly associated with past medical history (Table 3). Among the patients who had hypertension, the most common psychiatric illness was MDD (16), followed by generalized anxiety disorder (10), psychotic disorder (3) and social phobia (1).

In the present study psychiatric illness in post stroke survivors was not significantly associated with type of lesion. As seen in table 4, among the 150 patients, most of the patients had ischemic stroke (139), while the rest had hemorrhagic stroke(11). Patients with ischemic stroke had MDD (48) as the most common psychiatric illness followed by GAD generalized anxiety disorder (20), psychotic disorder (3) and social phobia (2).

Table 2. Association between socio demographic details of post stroke survivors and psychiatric morbidity

Demographic variable	Psychiatric Illness						Total	P value*
	Psychotic disorder (a) (n=3)	Generalized Anxiety Disorder (b) (n=24)	Major Depressive Disorder (c) (n=50)	Social Phobia (d) (n=2)	Total (a+b+c+d) (n=79)	Absent(n=71)		
Age group								
20-35	0	2	8	0	**10**	**8**	**18**	
36-50	3	6	24	1	**34**	**26**	**60**	
>50	0	16	18	1	**35**	**37**	**72**	**0.156**
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**	
Sex								
Male	3	17	33	2	**55**	**53**	**108**	
Female	0	7	17	0	**24**	**18**	**42**	**0.687**
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**	
Occupation								
Bussiness	0	2	8	0	**10**	**3**	**13**	
Farmer	2	12	22	2	**38**	**50**	**88**	
Service	0	1	10	0	**11**	**13**	**24**	
Unemployed	1	9	10	0	**20**	**5**	**25**	
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**	**0.007**
Religion								
Hindu	3	20	49	2	**74**	**67**	**141**	
Muslim	0	3	1	0	**4**	**4**	**8**	
Christian	0	1	0	0	**1**	**0**	**1**	**.226**
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**	

*p Value is calculated by fisher exact test.

Table 3. Association between post stroke survivors's past medical history and psychiatric morbidity

Past Medical H/O	Psychiatric Illness						Total
	Psychotic disorder	Generalized Anxiety Disorder	Major Depressive Disorder	Social Phobia	Total (Psychiatric Illness)	Absent	
CKD	0	0	1	0	**1**	**0**	**1**
Diabetes Mallitus	0	2	5	0	**7**	**3**	**10**
Hypertension	3	10	16	1	**30**	**35**	**65**
Hypertension +Diabetes	0	2	3	0	**5**	**5**	**10**
Absent	0	10	25	1	**36**	**28**	**64**
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**

Chi-Square Tests				
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	10.821[a]	16	0.820	
Fisher's Exact Test	16.714			0.634
19 cells (76.0%) have expected count less than 5. The minimum expected count is .01.				

Fisher's Exact Test p value > 0.05 shows no significant association

Table 4. Association between post stroke survivor's type of stroke (haemorrhagic/ischemic) and psychiatric morbidity

Type of Lesion	Psychiatric Illness						Total
	Psychotic Disorder	Generalized Anxiety Disorder	Major Depressive Disorder	Social Phobia	Total (Psychiatric Illness)	Absent	
Haemorrhagic	0	4	2	0	**6**	**5**	**11**
Ischemic	3	20	48	2	**73**	**66**	**139**
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**

Chi-Square Tests				
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	4.299[a]	4	0.367	0.350
Fisher's Exact Test	4.221			0.379
a. 6 cells (60.0%) have expected count less than 5. The minimum expected count is .15.				

Fisher's Exact Test p value > 0.05 shows no significant association

Table 5. Association between post stroke survivor's side of lesion (left/right) and psychiatric morbidity

	Psychiatric Illness						Total
	Psychotic Disorder	Generalized Anxiety Disorder	Major Depressive Disorder	Social Phobia	Total (Psychiatric Illness)	Absent	
LT CVA	3	16	28	2	**49**	**39**	**88**
RT CVA	0	7	14	0	**21**	**21**	**42**
Multi Infarct	0	1	8	0	**9**	**11**	**20**
Total	**3**	**24**	**50**	**2**	**79**	**71**	**150**

Chi-Square Tests				
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	6.116[a]	8	0.634	0.640
Fisher's Exact Test	4.676			0.795
N of Valid Cases	150			
a. 7 cells (46.7%) have expected count less than 5. The minimum expected count is .27.				

Fisher's Exact Test p value > 0.05 shows no significant association

Table 6. Association between post stroke survivor's MMSE Score and psychiatric morbidity

Psychiatric diagnosis	MMSE Score			Total
	22 to 24	25 to 27	28 to 30	
PSYCHOTIC DISORDER	0	3	0	**3**
GENERALIZED ANXIETY DISORDER	9	12	5	**26**
MAJOR DEPRESSIVE DISORDER	10	25	15	**50**
SOCIAL PHOBIA	0	0	0	**0**
ABSENT	23	31	17	**71**
Total	**42**	**71**	**37**	**150**

Chi-Square Tests				
	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	6.565[a]	6	.363	.362
Fisher's Exact Test	5.318			.480
N of Valid Cases	150			
a. 3 cells (25.0%) have expected count less than 5. The minimum expected count is .74.				

Fisher's Exact Test p value > 0.05 shows no significant association

The psychiatric morbidity in post stroke survivors are not significantly associated with the side of lesion. As seen in table 5 most patients have left side of lesion (88) followed by right side lesion (21) and multiple infarcts (11). Among the patients with keft sided lesion, the most common psychiatric morbidity was Major Depressive Disorder (28) followed by generalized anxiety disorder (16) and psychotic disorder (3).

In the present study (table 6), 47.33% patients had MMSE score between range 25-27. Among them 35% patients were having MDD, followed by GAD and psychotic disorder. MMSE score was not associated with psychiatric illness.

5. Discussion

5.1 Psychiatric Morbidity Among Stroke Survivors

In the present study, the most common psychiatric illness was major depressive disorder (33%) followed by generalized anxiety disorder (16%), which is in line with study by Rajashekaran P. *et al* which states that the most common psychiatric illness was MDD followed by GAD[10].

5.2 Association Between Socio Demographic Details of Post Stroke Survivors and Psychiatric Morbidity

5.2.1 Age Group

In the present study age was not significantly associated with psychiatric morbidity. 48% of the patients were of age more than 50 years, 40% were of age 36-50 years and 12% were of age 20 -35 years. This finding is in agreement with the study conducted by Rajashekaran P *et al.* in which, more than 50 % of the patients had age above 50 years[10].

In the age group above 50 years 51.4% patients had MDD, followed by 45.71% patients had GAD, and 1 patient with social phobia, this is in line with study Pedroso *et al.* in which psychiatric diagnosis was present in 55 % of patients with mean age 64 years[11].

Among age group 36-50 years 70.5% patients had MDD. This finding is in agreement with study by Srinivasa Rao S *et al.* in which mean age was 46.25 years and middle age was significantly associated with post stroke depression (62%)[12].

Among age group 20-35 years 80% patients had MDD followed by GAD in 20% patients. This is in line with the study by McCarthy MJ *et al.* in which 19% were among age group 25-55 years and among them 25% of the patients had Major Depressive disorder[13].

5.2.2 Gender

In this study psychiatric illness in post stroke survivors was not associated with gender. 72% patients were male and 28% were female. This is in the study by Pasha *et al,* showed in which male preponderance (67.9%) was seen[14].

In males MDD was present in 60% patients where as in females MDD was present in 70.8% this is in line with study by Obiora Iteke., *et al.* in which 20% males were having MDD[15].

5.2.3 Occupation

We found in the present study psychiatric illness in post stroke survivors was significantly associated with occupation (p value =0.07). In our study, 58.66% patients were farmers, 16.66% were unemployed, 10.66% patients were service-men and 8.66% patients were business-men. This is comparable with study by Paramdeep Kaur *et al* which shows among rural population most working patients in their study were farmers (30%) followed by housewives and service-men (17%)[16].

Among the farmers 25% had MDD. This can be compared with study by Ibeneme, Sam Chidi *et al,* in which 12 % patients were farmers and among them 33% patients had major psychiatric illness as MDD[17].

Among the patients who were unemployed 40% had MDD. This is comparable with study by Srinivasa rao *et al.* in which 32% patients were unemployed and among them 35% patients had depression[12].

Among the patients who were doing service (41.66%) and business (61.53%) had MDD. This was in line with study by Ibeneme SC, *et al.* Gyagenda JO *et al.* and Sharma *et al.* reports 48% were doing service, among them 39.28% had psychiatric illness[17,18,19].

5.2.4 Religion

Psychiatric illness in post stroke survivors was not significantly associated with religion. 94% patients in this study were Hindu, 5.33% were Muslim and 0.6% were Christian. Similar finding was found in the study by Paramdeep Kaur *et al.* in Ludhiana where most Hindu or Sikh among most common among study population[16].

Among patient who were Hindus 66.21% were having MDD (49) and in Muslims 75% had GAD. This can be

seen in line with study by Pasha *et al.* and Srinavasa *et al.* reports most common population were Hindus (80.4%) in which 5% patients were Muslims[12,14].

5.3 Association Between Post Stroke Survivors' Past Medical History and Psychiatric Morbidity

In this study psychiatric illness in post stroke survivors was not significantly associated with past medical history. 43.33% patients had hypertension, 6.66% patients had diabetes, 6.66% patients had diabetes with hypertension and 1 patient had Chronic Kidney Disease (0.6%). This can be seen in line with study by Chiu YC *et al.* in which hypertension was present in 21%[20].

Among the patients with hypertension 24.61% had MDD, 15.3% patients. This is in line with study by Amrish Saxena *et al.* reported that 64% of patients were having hypertension followed by diabetes[21].

Among patients with diabetes 50% patients had MDD this is in accordance of study by PO Ajiboye *et al.* in which 13.3% diabetic patients were having psychiatric illness. Most common psychiatric illness was MDD (19.2%)[22].

Among patients with diabetes and hypertension 30% were had MDD. This is also in accordance with the study by Pedroso *et al.* hypertension and obesity were highly frequent with psychiatric disorder were diagnosed in 55% patients[11].

5.4 Association Between Post Stroke Survivor's Type of Stroke (Haemorrhagic/Ischemic) And Psychiatric Morbidity

In the present study psychiatric illness in post stroke survivors was not significantly associated with type of lesion.

Among 150 patients 92.66% patients had ischemic stroke and rest 7.33% patients were having Haemorrhagic. This is in accordance with the study by Rinu Susan Raju reports most common type of stroke was ischemic (77.2%)[23].

In ischemic stroke 65.75% were had MDD, followed by 27.39% GAD, 4.10% psychotic disorder and 1 patient with social phobia. This can be compared with study by Ho-Yon Yvonne Chun which reported that ischemic stroke (62%)[25].

5.5 Association Between Post Stroke Survivor's Side of Lesion (Left/Right) And Psychiatric Morbidity

Psychiatric morbidity was not significantly associated with side of lesion. 58.66% patients had left side of lesion, followed by 28% right side lesion and 7.33% had multiple infarcts. This is in line with the study by Rajashekaran *et al.,* which reported post stroke depression was more common with left sided lesion[10].

In left sided lesion 57.21% patients had MDD, 32.65% patients have GAD, 6.12% patients had psychotic disorder and 2 patients had social phobia. Similar correlation was found in the study by Alex J. Mitchell where depression was present in 33.5 % of post stroke survivors and risk of depression was higher after left hemisphere stroke[26].

In right sided lesion 66.66% patients had MDD, 33.33% patients were having GAD. This can be compared with study by Rajashekaran *et al.* in which17.9% patients were having post stroke depression[10].

5.6 Association Between Post Stroke Survivor's MMSE Score and Psychiatric Morbidity

In the present study (table D) the 47.33% patients had MMSE score between range 25-27. Among them 35% patients were having MDD, followed by GAD and psychotic disorder. MMSE Score not associated with psychiatric illness. this can be compared with study by by A. Bour *et al.* in which MMSE Score was analysis in two three groups <24, 24-27 and >27. Mean MMSE in their study was 25.5[8].

6. Conclusion

In the present study the analysis of demographic factors among post stroke survivors reveals significant presence of farmers. This study is in line with earlier Indian studies. Majority of patients had ischemic stroke and had left sided lesion. MDD was predominant psychiatric illness among farmers. All the post stroke patients particularly in rural background should be evaluated for psychiatric morbidity and be adequately managed. This should improve their quality of life. This information needs to be validated by the study involving larger number of patients.

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