ORIGINAL RESEARCH PAPER

Psychiatry

A STUDY ON CLINICAL CORRELATES OF POST-STROKE ANXIETY

KEY WORDS: PSA, HAM-A, HAM-D, Stroke

Dr. Swayanka Samantray* PG resident, Department of Psychiatry, IMS and SUM Hospital, Siksha 'O' Anusandhan Deemed to be University, Kalinganagar, Bhubaneswar, Odisha 751003.*Corresponding Author

Dr. Srikanta Ku. Sahoo Associate Professor, Department of Neurology, IMS and SUM Hospital, Siksha 'O' Anusandhan Deemed to be University, Kalinganagar, Bhubaneswar, Odisha 751003.

Prof. (Dr.) Surjeet Sahoo Professor and Head of the Department, Department of Psychiatry, IMS and SUM Hospital, Siksha 'O' Anusandhan Deemed to be University, Kalinganagar, Bhubaneswar, Odisha 751003.

Dr. S.R. Dash Assistant Professor, Department of Psychiatry, IMS and SUM Hospital, Siksha 'O' Anusandhan Deemed to be University, Kalinganagar, Bhubaneswar, Odisha 751003.

ABSTRACT

Objectives: Aim of our study is to determine the relation of age of stroke onset, gender, type of stroke, site of lesion and medical comorbidities such as diabetes and hypertension with HAM-A scores in PSA. **Materials and Methods:** Present study was a hospital based cross sectional study conducted over 2 months that included 61 patients from neurology OPD of IMS and SUM Hospital, Bhubaneswar. Purposive sampling was done. The patients fulfilling the inclusion and exclusion criteria were first assessed using a semi structured proforma in order to obtain the socio-demographic data. Based on the clinical findings and using ICD 10-DCR criteria the 61 patients with CVA were segregated as stroke with anxiety disorder and without anxiety disorder. HAM-A and HAM-D scales were applied on both the groups. MRI findings were obtained. **Results:**There was significant difference on HAM-A (F=0.031, p=0.000) and HAM-D scores (F=4.453, p=0.039) between the two groups with PSA patients showing higher mean value as compared to non-anxiety stroke patients. There was no significant difference with respect to type of stroke ($\chi 2$=2.566; p=0.109), hemispherical involvement ($\chi 2$=2.621; p=0.270) and medical co-morbidities i.e. hypertension and type 2 DM between the two groups. There was no significant difference in the mean HAM-A scores across the two hemispheres (p= 0.384), types of stroke (p=0.605), and medical co-morbidities [hypertension (p=0.204); type 2 DM (p=0.965)] among PSA patients. **Conclusion:** In PSA patients the higher mean value of HAM-D in comparison to stroke patients without anxiety suggests that anxiety disorder in stroke survivors may be a predictor of impending depressive disorder. Age, gender, type of stroke and site of lesion do not show any correlation with PSA in our study in contrast to other studies which can be attributed to the sample size of this study.

INTRODUCTION

According to the World Health Organization (WHO), stroke is a rapidly growing focal or global brain dysfunction in which the symptoms may last for 24 hours or more leading to death due to vascular cause after ruling out all other causes. It is caused by the interruption of the blood supply to the brain, usually because a blood vessel bursts or is blocked by a clot. After heart disease and cancer, stroke ranks third in the order of causes of death (Pratiwi et al., 2017). Impaired brain function in stroke includes physical disturbance such as weakness in the limbs, communication difficulty, difficulty in swallowing, imbalance and emotional disturbance as well as sudden cognitive deficit (Pratiwi et al., 2017).

Several studies found out that, in patients with ischemic stroke anxiety symptoms are more common than depressive symptoms (Espárrago Llorca et al., 2015). Depression, anxiety and physical illness in stroke patients have strong correlation in deteriorating the outcome. Various studies have shown that the quality of life of post stroke patients are severely affected due to depressive and anxiety symptoms (Pratiwi et al., 2017). To achieve excellent quality of life for post stroke patients we need to ensure their mental health care, proper rehabilitation for physical disability, good supportive care and easy availability of affordable health care facilities.

According to one study among all mental health disorders, anxiety disorders have been considered as the most prevalent with approximate lifetime prevalence rate of 11%(Kessler et al., 2009). Post stroke anxiety(PSA) occurs in almost 24 % of stroke patients (Campbell Burton et al., 2013). In one study the prevalence rate of PSA was 21.1 % out of which 25% were diagnosed with anxiety illness acutely after stroke and 20% continued to have anxiety even after 3to 6 months (Barker-Collo, 2007). Similar findings were also observed in another study (Robinson, 2001). In one study they found that the prevalence of PSA was 20.4%. They also highlighted the co-occurrence of anxiety and depression as co-morbid affective illnesses post stroke (Schöttke & Giabbiconi, 2015). One meta-analysis suggested that PSA was correlated significantly to depression however there was lack of data on other correlations that were modifiable (Wright et al., 2017). According to this meta-analysis only one study reported the association of PSA with pre-stroke anxiety and pre stroke depression(Wright et al., 2017). PSA is an alarming issue and it has been correlated to decreased quality of life associated with health (Donnellan et al., 2010). It has also been established that PSA could be one of the predictive factors of depressive illness in stroke patients (Ayerbe et al., 2013). Hence it will be extremely helpful if we screen for anxiety illness in post stroke patients in order to prevent the occurrence of post stroke depression (Rafsten et al., 2018). PSA is an understudied topic as compared to PSD despite its alarming prevalence (Campbell Burton et al., 2013).

Since PSA is an understudied and neglected topic, it is essential to explore this subject by moving our focus from post stroke depression to post stroke anxiety. Also as implicated by previous studies it is essential to identify post stroke anxiety as it can have a predictive value in the identification of depressive illnesses in stroke survivors.

Moreover there is scarcity of research on this topic especially from an Indian perspective.

AIM AND OBJECTIVE

To compare the relationship of lesion location as well as type of stroke in the brain and medical comorbidities such as hypertension and type 2 diabetes mellitus (DM) between PSA and non-stroke anxiety patients.

MATERIALS METHOD

Present study was a hospital based cross sectional study conducted over a period of 2 months that included 61 patients from neurology OPD of IMS and SUM Hospital, Bhubaneswar. Purposive sampling was done. The patients, who were diagnosed with cerebrovascular accidents/stroke by neurologists after clinical evaluation and neuroimaging studies suggestive of stroke, were included. Those giving written consent were included. Those with history of any other debilitating medical or other neurological conditions apart from the disease mentioned above (except type two DM and hypertension) and pre-existing psychiatric illnesses prior to stroke were excluded. The patients who had recent occurrence of stroke in the last 3 months(Chun et al., 2018) of the study were excluded. Socio-demographic data was collected in a semi structured proforma. Based on the clinical findings, HAM-A (Hamilton Anxiety Rating Scale)(MAX HAMILTON, 1959) score (score>/=17 suggesting PSA) and using ICD 10-DCR criteria of organic anxiety disorder, the 61 patients with CVA were segregated as stroke with anxiety disorder and without anxiety disorder. Psychometric tests such as HAM-A and HAM-D (Hamilton Depression Rating Scale)(M. HAMILTON, 1960) scales were applied on both the groups. The result was analyzed using SPSS 20 v and appropriate statistical test.

RESULTS

TABLE 1: Socio-demographic characteristics of stroke patients with anxiety disorder(N=37) and stroke patients without anxiety disorder (N = 24)."

Sl. No	Variables		Stroke Patients with anxiety disorder (N=37) n (%)	Stroke Patients without anxiety disorder (N=24) n (%)	2	P
1	SEX	Male	22 (59.5%)	17 (70.8%)	0.817	0.366
		Female	15 (40.5%)	7 (29.2%)		
2	OCCUPATION	Employed	17 (45.9%)	6 (25%)	2.719	0.099
		Unemployed	20 (54.1%)	18 (75%)		
3	DOMICILE	RURAL	17 (45.9%)	10 (41.7%)	0.108	0.742
		URBAN	20 (54.1%)	14 (58.3%)		
			Mean + SD	**Mean + SD**	**F**	
4	Age (in years)	15-60 yrs	60.78+12.27	66.00+12.38	0.110	0.742

Table 1 displays the comparison of socio-demographic variables between the 2 groups (stroke patients with and without anxiety disorder) using Chi Square Test. The 2 groups were comparable with respect to age (F=0.110; p=0.742), sex (χ^2 =0.817; p=0.336), occupational status (χ^2=2.719; p=0.099) and domicile (χ^2=0.108; p=0.742).

Table 2 shows the clinical variable mainly the objective pathology of stroke patients with and without anxiety disorder on HAM-A and HAM-D. Independent t-test has been used for the above comparison. There was statistically significant difference on HAM-A and HAM-D scores between the two groups with the PSA patients showing higher mean value as compared to non-anxiety stroke patients.

Table 2: Clinical characteristics of the anxiety (N=37) and non-anxiety stroke patients (N=24)

Sl. No	Variables	Stroke Patients with anxiety disorder (N=37) Mean+SD	Stroke Patients without anxiety disorder (N=24) Mean+SD	F	P
1	HAM-A	21.70+3.22	12.21+3.22	0.031	<0.01**
2	HAM-D	21.68+4.30	11.58+3.35	4.453	0.039*

** significant at 0.01 level *significant at 0.05 level

Table 3: Comparison of stroke type, site of lesion, medical co-morbidities (Type 2 DM and Hypertension) between post stroke anxiety (N=37) and non-anxiety stroke patients (N=24).

Sl. No	Variables	Stroke Patients with Anxiety disorder (N=37) n (%)	Stroke Patients without anxiety disorder (N=24) n (%)		2	df	P
1	STROKE TYPE	Hemorrhagic	15 (40.5%)	5 (20.8%)	2.566	1	0.109
		Ischemic	22 (59.5%)	19 (79.2%)			
2	HEMISPHERE	B/L	3 (8.1%)	5 (20.8%)	2.621	2	0.270
		Left	16 (43.2%)	11 (45.8%)			
		Right	18 (48.7%)	8 (33.3%)			
3	HYPERTENSION	Yes	27 (73%)	16 (66.7%)	0.278	1	0.598
		No	10 (27%)	8 (33.3%)			
4	DIABETES MELLITUS	Yes	10 (27%)	9 (37.5%)	0.745	1	0.388
		No	27 (73%)	15 (62.5%)			

Table 3 displays the comparison of clinical variables between the 2 groups (stroke patients with and without anxiety disorder) using Chi Square Test. There was no significant difference between the 2 groups with respect to type of stroke (χ^2=2.566; p=0.109), hemispherical involvement (χ^2=2.621; p=0.270) and medical co-morbidities i.e. hypertension and type 2 DM.

Table 4: The mean HAM-A scores across gender, age, hemispherical involvement, type of stroke, hypertension and type 2 DM among post-stroke anxiety patients.

Sl. No	Post stroke anxiety patients		HAM-A		p
			Mean	SD	
1	HEMISPHERE	Left	21.60	2.75	0.384
		Right	22.29	3.65	
2	TYPE OF STROKE	Ischemic	21.70	3.38	0.605
		Hemorrhagic	21.71	3.07	
3	HTN	Yes	21.96	3.53	0.204
		No	21.09	2.39	
4	TYPE 2 DM	Yes	21.91	3.24	0.965
		No	21.62	3.28	

Table 4 displays the mean HAM-A values across hemisphere, type of stroke and medical comorbidities among post-stroke depressive patients using Independent t test. There was no significant difference in the mean HAM-A scores across the two hemispheres (p= 0.384), types of stroke (p=0.605), and medical co-morbidities [hypertension (p=0.204); type 2 DM

(p=0.965)] among PSA patients.

DISCUSSION

In our study the PSA and non-anxiety stroke groups were comparable with respect to age, sex, domicile and occupation. In our study out of 61 stroke patients 37 patients had anxiety while 24 stroke patients had no anxiety. The mean HAM-A score was 21.70±3.22 among PSA patients. PSA patients showed higher mean value on HAM-D as compared to non-anxiety stroke patients in our study. It was seen in one study that the relation between stroke and anxiety did not depend on the depressive symptoms contrary to our finding(Lambiase et al., 2014). One meta-analysis suggested that PSA was correlated significantly to depression similar to our finding however there was lack of data on other correlations that were modifiable (Wright et al., 2017). According to this meta-analysis only one study reported the association of PSA with pre-stroke anxiety and pre stroke depression (Wright et al., 2017) however in our study pre-stroke anxiety and depressive patients were excluded. Many studies have found that anxiety is significantly associated and co-morbid with depressive illness similar to our finding (Åström, 1996; Castillo et al., 1995). In one study one-fifth of the sample of stroke presented with some or the other anxiety disorder 3 months after stroke(Chun et al., 2018). It has also been established that PSA could be one of the predictive factors of depressive illness in stroke patients (Ayerbe et al., 2013). Hence it will be extremely helpful if we screen for anxiety illness in post stroke patients in order to prevent the occurrence of post stroke depression (Rafsten et al., 2018).

There was no significant difference between the two groups i.e. post stroke anxiety and non-stroke anxiety patients with respect to gender. Also there was no statistical difference in the mean age of onset of stroke between the above two groups. The likelihood of developing anxiety disorder post stroke was more in case of younger adults unlike our results and also those who had history of pre-existing depressive or anxiety disorder prior to occurrence of stroke (Chun et al., 2018). In one study, on uni-variable analysis it was seen that younger age and female sex were significantly correlated with higher scores on anxiety scale among stroke patients in contrast to our study(Broomfield et al., 2014). Most studies that have observed the correlation of post stroke anxiety with age and gender have suggested that female gender(Valerie Morrison et al., 2000; Schultz et al., 1997)(Val Morrison et al., 2005) and younger age(Schultz et al., 1997), are at higher risk of developing PSA among stroke survivors which is opposite to this study. On the contrary some reports do not show any significant relationship similar to our findings (Dennis et al., 2000). PSA in acute stroke was significantly correlated with younger age (Kim et al., 2018).

In our study there was no significant difference statistically with respect to type of stroke (^{2}=2.566; p=0.109), hemispherical involvement (^{2}=2.621; p=0.270) as well as medical co-morbidities i.e. hypertension and type 2 DM. There is no significant difference in the mean HAM-A scores across the two hemispheres (p= 0.384) and types of stroke (p=0.605). Also, the presence/absence of medical co-morbidities such as hypertension (p=0.204) and type 2 DM (p=0.965) do not cause any significant difference in the mean HAM-A scores among PSA patients. In various studies it has been found that post stroke anxiety is associated with right hemispheric stroke unlike our study. However, when co-morbid depressive disorder is present left hemispherical preponderance is seen (Åström, 1996). Another study found lesions in posterior part of right hemisphere of the brain to be correlated with anxiety in stroke patients in contrast to our findings. However, if worry was present without the diagnosis of an anxiety illness then anterior lesions were present in stroke patients (Castillo et al., 1993). When hemorrhagic stroke is present in some important mood circuits for e.g. PFC (pre-frontal cortex) and BG (basal ganglia), then behavioral symptoms such as anxiety or depression may be seen (Planton et al., 2018). Some areas of cerebral hemisphere namely subcortical circuits of white matter, limbic system, may be responsible for regulation of emotions and hence may be implicated in post-stroke anxiety in case of ischemic stroke. However this finding was only seen in acute stroke and not after 3 months(Li et al., 2019). In one recent study it has been found that anxiety in post stroke patients is mostly seen in hemorrhagic stroke in contrast to our finding (Ojagbemi et al., 2017). In ischemic stroke cerebellum, right middle frontal gyrus and brainstem have been implicated to anxiety symptoms according to one study (Vicentini et al., 2017). In the same study PSA was not associated with the lesion location of ischemia rather disruption of default mode network (Vicentini et al., 2017). In one study it was seen that anxiety in chronic stroke was correlated to hypertension as opposed to our finding (Kim et al., 2018). Our study has contrary findings to various previous studies which can be attributed to the sample size. Further we can make efforts to find the correlation of pre-existing anxiety or depressive illness with PSA.

CONCLUSION

In conclusion age, gender, type of stroke and site of lesion do not show any correlation with PSA in our study. Also hypertension and type 2 DM do not differ in post stroke anxiety patients and non-anxiety stroke patients. In PSA patients, the higher mean value of HAM-D in comparison to stroke patients without anxiety illness suggests that anxiety disorder in stroke survivors may be a predictor of impending depressive disorder. Hence efforts can be made to screen anxiety illnesses in stroke survivors in order to prevent post stroke depression. Also, efforts can be made to classify the types of anxiety disorders in post stroke anxiety patients and find their correlation to various areas of brain via neuroimaging such as fMRI.

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