



Original Article

Assessment of Risk Factors of Depression In The Post-stroke Phase of The Stroke Survivor Patients: A Cross-sectional Study

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ABSTRACT

Depression and mood changes are important complications of a stroke. A total of 30% of stroke survivors potentially develop depression, sooner or later. Despite its effect on the quality of life of the patient as well as functional recovery, it is often neglected resulting in a lack of treatment. However, regular antidepressant drugs play no beneficial role in the treatment of PSD. **Objective:** The present study aim is to the establishment of prevalence and factors responsible for causing post-stroke depression. **Methods:** The participants included in the study previously had strokes according to the definition given by WHO. Modified Motor Assessment Scale (MMAS) and Depression Anxiety Stress Scale-21 (DASS-21) were administered. Socio-demographic data of all the patients was collected. The risk factors were the laterality of the stroke, duration of the post-stroke phase, functional impairment after the stroke, and gender of the patient. **Results:** A total of 62 participants were included in the study. A total of 38 (61.29%) of the patients were male and 24 (38.71%) were female. The mean age of the patients was 51.86±5.3 years with a range of 41 to 63 years. Assessment through DASS-21 showed that 46 (74.19%) patients were normal and 16 (25.81%) were detected with depression. The statistically significant risk factors behind post-stroke depression (PSD) were gender and stroke laterality. However, the assessment through MMAS scores shows no significant participation of post-stroke disability and post-stroke duration in PSD. **Conclusion:** PSD is an important complication followed by stroke. Stroke laterality and gender are significant risk factors for PSD.

INTRODUCTION

Depression and mood changes are important complications of a stroke. A total of 30% of stroke survivors potentially develop depression, sooner or later. Despite its effect on the quality of life of the patient as well as functional recovery, it is often neglected resulting in a lack of treatment. However, regular antidepressant drugs play no beneficial role in the treatment of PSD [1]. Other neuropsychiatric disorders correlated with cerebrovascular disease are anxiety disorder, cognitive

disorder, apathy, mania, catastrophic reaction, psychosis, anosognosia, and fatigue. Martin Roth conducted the first empirical research on PDS. He demonstrated the association between depression and atherosclerotic diseases [2]. In a comparison of the extent of depression in patients with stroke history and other impairments such as orthopedic injuries, depression was more potent and common in stroke survivors [3]. PSD hinders the process of recovery and rehabilitation. It plays an impeding role in the

quality of life and also increases the rate of mortality. The interaction between stroke and depression is quite complicated and the pathophysiology behind their interrelationship is elucidated. Endogenous depression due to neurochemical alterations can be the rationale [4]. Implementation of preventive measures and the use of therapeutic strategies for the reduction of mood alteration can help in the rehabilitation process [5]. PSD is common in all patients of stroke, however, it is seen as more common in females. According to the study by Poynter, the CT scan of both male and female brains experiencing PSD has shown the difference. Women had a higher rate of lesions in the left hemisphere compared to men [6]. Major depression is not related to the location of the lesion. It is evident from some studies that the social and personal factors related to the patient before the stroke were also responsible for causing PSD [7]. Some studies suggest that PSD is consistent with the biophysical model of mental illness [8]. The present study's aimed the establishment of prevalence and factors responsible for causing post-stroke depression

METHODS

The present study included a total of 62 participants. They all had survived a stroke. Their stroke was diagnosed based on the definition given by WHO according to which a stroke is focal, sudden in onset and lasts more than 24 hours. Some of the patients included in the study also had some degree of post-stroke disability. However, the cognitive abilities of all the included patients were intact as assessed by Mini-Mental State Examination. Aphasic patients were not included in the study according to the inclusion and exclusion criteria. Permission was taken from the ethical review committee of the institute. Patients were clinically evaluated for the determination of the laterality of the stroke. Only a few cases were undergone imaging for this purpose because of the cost of the imaging. Written informed consent was taken from all the patients included in the study. They all were given a brief detail of the research before taking the consent. The sociodemographic history of all the patients was collected on a questionnaire. Depression Anxiety Stress Scale (DASS-21) was used for grading depression in the patients. It is a reliable and valid scoring system. The normal scale for depression is from 0 to 9. 10-12 is mild depression, 13-20 is moderate depression, 21-27 is severe depression, and 28-42 is very severe or extreme depression [9]. The other tool used in the present study is Modified Motor Assessment Scale. It is used for the assessment of motor and functional impairment in patients with stroke. It has eight items in which the scores are given between 0-6. The maximum score can be 48 [10]. All the subjects were administered

the DASS-21. Some patients could not write but they could demonstrate their answers to the questionnaire. The questionnaire was supervised by the first researcher. All the patients were assessed with the MMAS for motor functioning or impairment. The data was analyzed by IBM SPSS version 26.0. The p-value of less than 0.05 was considered significant.

RESULTS

There were a total of sixty-two stroke patients in the present study. A total of 38 (61.29%) of the participants were men and 24 (38.71%) were women. Their mean age was 51.86 ± 5.3 years and the range of age was 41-63 years. According to the score of DASS-21, 46 (74.19%) patients were normal and 16 (25.81%) were detected with depression. According to the classification of DASS-21, 6 (9.68%) patients were moderately depressed, 9 (14.52%) were severely depressed and 1 (1.61%) were extremely depressed. The mean DASS-21 score of the patients was 11.4 ± 7.6 . Table 1 shows the results of the DASS-21 scoring.

Classification	DASS-21 scoreation	Number	Percentage (%)
No Depression	0-9	46	74.19(%)
Mild depression	10-12	0	0(%)
Moderate depression	13-20	6	9.68(%)
Severe depression	21-27	9	14.52(%)
Extreme depression	28-42	1	1.61(%)
Total		62	100(%)

Table 1: Depression cases according to DASS-21

Table 2 shows the risk factors of PSD. Out of a total of 16 patients detected with PSD on DASS-21, 10 (62.5%) were female and 6 (37.5%) were male. The p-value was 0.001, hence, the gender difference was statistically significant. PSD was more common in women compared to men. Similarly, stroke was seen to be focal in the right hemisphere in 12 (75%) of the patients and the left hemisphere in 4 (25%) of the patients. The difference between the laterality of the stroke was 0.014 which is statistically significant. Therefore, it is seen that the right hemisphere was involved more in the patients with PSD. A total of 9 patients had more than 25 MMAS scores, whereas, 7 patients scored less than 25. The difference was not statistically significant. A total of 10 patients with PSD had survived stroke less than 6 months ago, 3 had survived 12 months ago and 3 had a stroke more than 12 months ago. The difference was not statistically significant.

Variables	Number of PSD patients (n=16)	Percentage (%)	p-value
Gender			
Male	6	37.5(%)	0.001
Female	16	62.5(%)	
Laterality of Stroke			
Left hemisphere	4	25(%)	0.014
Right hemisphere	12	75(%)	

Variables	Number of PSD patients (n=16)	Percentage (%)	p-value
Post-stroke impairment			
MMAS \leq 25	9	56.25(%)	0.083
MMAS \geq 25	7	43.75(%)	
Post-stroke duration			
onset to 6 months	10	62.5(%)	0.079
7-12 months	3	18.75(%)	
More than 12 months	3	18.75(%)	
Total	16	100	

Table 2: Risk factors of PSD

DISCUSSION

Stroke is known to be one of the major causes of mortality in developing countries. Nonetheless, it has not been given enough attention. The present study focuses on depression occurring in the post-stroke phase with a special emphasis on the risk factors of PSD. There are several studies regarding the identification and understanding of the risk factors of PSD. According to the study by Ouimet et al, past psychiatric history, depression, functional impairment, and social isolation were determined as risk factors for PSD [11]. Physical disability and the severity of stroke also play an important role in the development of PSD [12]. Paolucci et al also identified female gender and a history of a previous stroke as potential participating factors in PSD as well [13]. Our study is consistent with the study of Paolucci in terms of the female gender as a risk factor for PSD. In our study, a higher percentage of female patients developed PSD compared to male patients. Moreover, it is also generally observed that depression is more common in women than men [14]. According to the systemic review done by Carson et al, there was no significant difference between the locations of the lesion. However, seven studies showed a lesion in the right hemisphere and two showed a lesion in the left hemisphere [15]. These results are consistent with the result of the present study in which 75% of the patients had right laterality of the stroke. The difference was also statistically significant. Similarly, the study of Nickel et al also suggests that right hemisphere laterality of stroke is frequently observed in patients with PSD [16]. Motor functions are commonly impaired followed by a stroke. Our study suggests that patients with a higher degree of motor function impairment lead to PSD, nonetheless, the difference was not statistically significant. These results are consistent with the study of Ouimet et al in which 16.1% of the subjects who had good MMAS scores had also developed PSD [11]. In the present study, PSD was more common in patients who had recently survived a stroke compared to those who had a stroke a long time ago. These findings are consistent with the study of Morrison et al. They concluded that depression decreases over time [17].

There were 102 stroke patients in total in a global study. Sixty-two of them (or 60.78%) had depression in total. Multivariate logistic regression found associations between post-stroke depression and smoking, hypertension, worse physical impairment, and poor cognitive function. [18]. In a related research, following multivariate analysis, only "previous history of the depressive episode" remained a significant predictive factor for PSD [19]. According to the results of another study, gender is a distinct risk factor for PSD during the acute stage of a stroke. PSD is more likely to occur in the chronic stage of stroke among those who smoke, live alone, or have frontal lobe lesions [20].

CONCLUSION

The present study has identified some significant risk factors for PSD. Female gender, right hemisphere laterality of the stroke, a higher degree of motor function impairment, and shorter duration of post-stroke phase are important risk factors that are potentially responsible for the development of PSD in stroke survivors.

Conflicts of Interest

The authors declare no conflict of interest.

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