ORIGINAL ARTICLE

Evaluation of Depression and its Contributing Factors in Patients after Stroke

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ABSTRACT

Background: Post stroke depression is a common complication following stroke whose prevalence varies over time.It has been suggested that predictors of psychological distress are severity of stroke, impaired cognition, loss of functional independence or inability to work and loneliness. The rationale of the current study is to determine the frequency of depression in stroke patients and the factors contributing to it, so that early diagnosis and intervention can be done to prevent further morbidity.

Aim: To determine the frequency of depression in patients after stroke and the frequency of factors contributing to depression in patients after stroke.

Methods: A cross sectional study, the Outdoor of Neurology department, Sir Ganga Ram Hospital, Lahore.Within 6 months after approval of synopsis i.e. from 18th of June, 2015 till 12th December 2015.Three hundredstroke patients were assessed by Hospital anxiety and depression scale for depression. For assessing impaired cognition, Mini Mental State Examination was applied, for assessing impairment in daily activities Barthel index and to assess stroke severity, Glasgow Coma Scale was applied.

Results: The results revealed that 30.7% patients suffer from depression after stroke and is significantly associated with the contributing factors. Out of total patients, 20.3% had impaired cognition, 40.7% had severe stroke and 31.9% had inability to carry out daily activities. The demographic factors assessed showed that they do modify the effects of contributing factors on depression.

Conclusion: Depression occurred in 30.7% of patients after stroke and was significantly associated with the contributing factors. The effect modifiers were not association with depression and its contributing factors, except age which was only significantly associated with impairment in daily activities.

Keywords: depression, stroke, impaired cognition, impairment in daily activities, severity of stroke.

INTRODUCTION

Stroke is characterized by rapidly developing clinical signs of focal (or global) disturbance of cerebral function, with symptoms lasting 24hours or longer or leading to death with no apparent cause other than of vascular origin. It is a major public health problem[1]. In developed countries, it represents the third most common cause of death; the first two being coronary heart diseases and cancer[2,3].

Stroke contributes to a variety of both mental and emotional disorders[2, 3]. One of the most common and frequent complication among neuropsychiatric disorders associated with stroke is post-stroke depression[1,3]. Post stroke depression is characterized by changes in the mood secondary to stroke.

Studies conducted in the past have revealed that the prevalence rates of post-stroke depression ranged from 25-30%, depending on patient selection and assessment criteria used[4-6, 8].Prevalence clearly varies over time with an apparent peak 3-6 months after stroke and subsequent decline in one year reaches 50% of the initial rates[4, 5].

It has been suggested that predictors of psychological distress are severity of stroke (388%)[5], impaired cognition (19.7%)[5], loss of functional independence or inability to work (33%)[5] and loneliness (28%)[5].

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Emotional and psychological distress is associated with poor outcomes and poor quality of life in patients[1, 3]. Mental health resources are difficult to access in most developing countries. In addition, traditional and cultural believes on the etiology of mental disorder in Pakistan may prevent many patients from accessing mental health services.

A large number of international studies are available on post-stroke depression, but the focus has only been kept on epidemiological features and effect of post-stroke depression on the quality of life and little knowledge is available regarding the precipitating factors [1]. In Pakistan, information regarding post-stroke depression is lacking. The aim of the present study is to increase awareness among physicians regarding this serious complication after stroke which affects patient's quality of life and to prevent factors precipitating depressive illness following stroke to improve mental health. If a high frequency is found then patients will be screened for depression after stroke and will be provided early treatment.

PATIENTS AND METHODS

Cross sectional study, The study will be conducted at the outdoor of Department of Psychiatry and outdoor of Medicine and Neurology department Sir Ganga Ram Hospital / Fatima Jinnah Medical College Lahore, Pakistan,The study was conducted within six months after approval of synopsis i.e., from 18th June 2015 till 12th December, 2015, The calculated sample size is 300 patients with 5% margin of error, 95% confidence level and taking expected percentage of depression i.e. 25% in

patients after stroke, Non-probability consecutive sampling technique.

Data Collection Procedure: Three hundred patients coming in Outdoor and indoor of Neurology department of Sir Ganga Ram hospital Lahore will be taken. The researcher (doctor) will take written informed consent. Each patient will be interviewed and then marked down by the doctor herself. All data will be entered in to the predesigned Performa, to evaluate the contributing factors in the form of impaired cognition and impairment in activities of daily living. Then Urdu version of HAD symptom checklist will be applied to find the presence and severity of depression as per operational definition. Contributory factors like impaired cognition will be assessed by MMSE (annexure IV), inability to carry out daily activities will be assessed by Barthelindex ,and stroke severity will be assessed by GCS.

Data Analysis Procedure: All the date will be entered and analyzed using SPSS version 12.0. Quantitative data like age, MMSE and Barthel index scores will be presented by mean and standard deviation. Qualitative data like gender, depression and severity of depression, and factors i.e. impaired cognition, impairment in activities and severity of stroke will be presented by frequency and percentages. Data will be stratified for age, gender, duration of stroke and socioeconomic status to deal with the effect modifiers. Post-stratification chi-square test will be applied. P-value less than or equal to 0.05 will be considered significant.

RESULTS

The study was conducted in the neurology outdoor of Sir Ganga Ram hospital, Lahore. For this purpose, data from 300 patients was collected. Out of 300 patients, 170 (56.7%) were males and 130(43.3%) were females. The age range for both males and females was 18-65 years and the results revealed that mean calculate aged was 48.45 years with standard deviation of 10.97. The patients with a duration of up till 1 year after stroke were included and results revealed that higher frequency of depression was found in patients with a stroke duration between 4 to 6 months.

According to socioeconomic status, mild depression was present in 18.7% of the patient, moderate depression in 8.7% patients and severe depression in 3.3% of the patients, with higher frequency of depression being found in patients with middle socioeconomic status.

The frequency of depression in stroke patients as assessed by HADs scale was 30.7% (Table 1) in which 18.7% had mild depression, 8.7% had moderate depression and 3.3% had severe depression. The chi square test was applied to see the effect modification of age, gender, duration of stroke and socioeconomic status on the results and p-value obtained was more than 0.05 for all of them, thus revealing that these variables do not modify the effect on depression.

The frequencies of three contributing factors namely impaired cognition, impairment in activities of daily living and severity of stroke were assessed. The cognitive impairment was assessed by MMSE and scores revealed that 79.7% had normal cognitive functions, and 20.3% had impaired cognition (Table 2), in which 14.3% had mild cognitive impairment, 5.0% had moderate cognitive impairment and 1% had severe cognitive impairment. With cognitive impairment, 7.4% had depression (TABLE 1). Those with normal cognitive functions, 23.4% had depression. The mean MMSE score was 26.7%, with standard deviation of 4.13. Chi square test was applied and p-value obtained is 0.001 which is highly significant and reveals that depression is strongly associated with cognitive impairment. The effect modifiers has no significant association with impaired cognition.

The impairment in daily activities was assessed by Barthel index and results revealed that the mean barthel index score was 88.1 with standard deviation of 17.68. The results showed that 68% of the patient had no impairment in daily activities, and 32% had impairment in activities of daily living (Table 3), in which 22.3% had mild impairment, 8.3% had moderate impairment and 1.3% had severe impairment. In patients with impairment in activities of daily living, 17% were depressed. In patients with severe impairment, 1.4% were depressed, those with moderate impairment, 4.4% were depressed, with mild impairment 11.3% were depressed and with minimal impairment 13.7% were depressed. Overall, it was seen that 30.7% patients were depressed depending on the degree of impairment (Table 2). Chi square test applied to see correlation between barthel index and depression revealed a p-value of 0.000, thus showing that the two variables are strongly associated with each other.Among the effect modifiers, only age was found to be significantly associated with impairment in activities of daily living as indicated by a p value of 0.000. No other effect modifier showed association with it.

The severity of stroke was assessed by Glasgow coma scale (GCS) and it revealed that 59.3% patient did not have severe stroke and 40.7% had severe stroke (Table 4). Of the severe cases, 16.7% had depression (Table 3). Chi square test applied revealed a p-value of 0.000 that again showed that severity of stroke and depression are strongly associated with each other.The effect modifiers were assessed and the results revealed that they are not associated with the severity of stroke.

Table 1: Frequency of Depression in Patients with Impaired Cognition and their Association

Cognitive Functions	Depression		Total	P Value
	Yes	No		
Normal cognitive functions	70 (23.4%)	169(56.3%)	239(79.7%)	
Impaired cognitions	22(7.4%)	39(13%)	61(20.4%)	
Total	92(30.7%)	208(69.3%)	300(100%)	0.001

Table 2: Frequency of Depression in Patients with Impairment in Daily Activities

Impairment In Activities of Daily Living	Depression		Total	P Value
	Yes	No		
No Impairment	41(13.7%)	163(54.3%)	204(68%)	0.000
Impairment	51(17%)	45(15%)	96(32%)	
Total	92(30.7%)	208(69.3%)	300(100%)	

Table 3: Frequency of Depression in Stroke Patients of Varying Severity

Severity Of Stroke	Depression		Total	P Value
	Yes	No		
NOT SEVERE	42(14%)	136(45.3%)	178(59.3%)	0.000
SEVERE	50(16.7%)	72 (24%)	122(40.7%)	
TOTAL	92(30.7%)	208(69.3%)	300 (100%)	

Table 4: Frequency of Depression in Different Age Groups and the Association

Age Range	Depression		Total	P Value
	Yes	No		
16-30	8	15	23	0.149
31-50	37	86	123	
51-65	47	107	154	
Total	92	208	300	

DISCUSSION

Though abundant research all over the globe has been carried out on estimating the prevalence of depression after stroke, yet the real prevalence rate of post stroke depression has not yet been established. The difference in rates found in different studies may possibly be due to the methodological issues and also due to usage of various means of assessing depression[13]. Some studies used different rating scales to assess depression while other diagnosed depression according to the criteria given by

International Classification of Diseases and some used the criteria of Diagnostic and Statistical Manual of Mental Disorders[14]. The present study used the rating scale named Hospital Anxiety and Depression Scale to assess depression in patients after stroke, which was a self-administered scale and therefore less time consuming and easily applicable.

A meta-analysis done by Hackett ML et al in 2006 revealed that the pooled estimated frequency of post stroke depression was 33%, even though the studies had significant differences[14]. Some studies revealed that the prevalence rate of depression was between

25-30 %[4-6]. The current study estimated that the prevalence of depression after stroke in Pakistan is 30.7%, which is almost similar as compared to other population based studies across the world.

Previous literature revealed that demographic variables are significant determinants of post stroke depression[1]. In our study the demographic variables assessed were age, gender, duration of stroke and socioeconomic factors. The results revealed that these factors do have an impact on the development of depression. This shows that demographic as well as social profile of a developing country, in which less expenses are spend on health and only few benefits are given to the disabled population.

Past researches also reveal that the major contributing factors of depression in patients with stroke include impaired cognition, inability to carry out daily activities, severity of stroke and loneliness. There was one study by Cassidy E et al in 2007, which didn't revealed the association of depression with inability to carry out daily activities following a stroke. Another study by Abhishek Srivastava et al in 2010, revealed that all factors are associated with depression except impaired cognition[1].In the current study, the relationship between the three contributing factorsi.e. impaired cognition, inability to carry out daily activities and severity of stroke was assessed and the results were similar to previous studies i.e. there was a significant impact of these factors on the development of depression.

CONCLUSION

The study results showed that following stroke, depression is often under recognized. There is a high prevalence of post stroke depression. The study revealed that about one third of patients i.e. 30.7% after stroke suffer from depression. Different contributing factors were assessed. Significant association was found between depression and the contributing factors i.e. impaired cognition, inability to carry out daily activities and severity of stroke. Among the effect modifiers, only age was significantly associated with impairment in activities of daily living. However, it was not associated with depression and other contributing factors and also the other effect modifiers didn't show association with depression and its contributing factors.

Limitations of the study: The study had few limitations. Firstly, it was conducted at one center so the results could not be generalized. Secondly, the study design used was cross sectional study which has less significance compared to randomized controlled trials and systematic review. The last limitation was that study was conducted on a targeted population resulting in bias.

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