Original Article

Depression after Stroke

# Incidence of Depression after Stroke, a Cross-Sectional Study Conducted in Khyber Teaching Hospital Peshawar Pakistan

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## ABSTRACT

**Objective:** To find the incidence of depression among all hospitalized patients who presented with stroke.
**Study Design:** Cross sectional study
**Place and Duration of study:** This study was conducted at Khyber Teaching Hospital, Peshawar**.** Total duration of the study was 12 months, starting from January, 2017 to December, 2017.
**Materials and Methods:** In this study, total 162 patients were enrolled after proper consent. Hamilton depression scaling score was applied to document depression.
**Results:** The mean age was 73 ± 27.71 years. 60% patients were male while 40% patients were female. Eighty percent patients had ischemic stroke while 20% patients had hemorrhagic stroke. The incidence of depression was found to be 35%. Females were more prone to develop depression as compared to male patients. The incidence of depression was high in early age and late old age.
**Conclusion:** Our study concludes that the incidence of depression was found to be 35% among hospitalized stroke patients.
**Key Words**: Acute ischemic stroke, Hemorrhagic stroke, Depression, PSD

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## INTRODUCTION

Stroke is an acute neurological deficit either focal or diffuse, which lost for more than 24 hours due to intra-cerebral infarct or bleeding. It results from non-traumatic vascular events. Its stand in the list of top three main causes of death and is considered one of the main reason for non-traumatic permanent disability, especially in adults. Approximately 2/3 of cases are usually reported in poor and developing countries. Compared to the Caucasians, it is more common in Asian and black African populations. It is usually reported in population above the aged population, but about one quarter of cases are observed blow the age of 65. About 20-25% people usually die following an acute of stroke[1]. Stroke, which is also considered as acute brain attack, result from decreased blood circulation to different part of the brain. This decreased blood may be either because of the ischemic stroke due to blockage of blood vessels and hemorrhagic stroke due to bleeding inside the brain parenchyma. Both these condition lead to brain ischemia and cell death.

Different level of depression is very common in these patients because there is life long disability and dependency following stroke. It is observed in the form of different cognitive, emotional and behavioral symptoms in these people following stroke. All these symptoms, appearing after stroke in are grouped together in a different entity, called post-stroke depression (PSD). PSD is considered as one of the most stressful and painful long-term sequale of depression. Some important cross-sectional studies in stroke survivors have shown that almost three fourth of those people who develop stroke goes into depression. Immediate PSD is reported in one third of people, while two third of these people develop depression later on at some stage of their life[2-4].

Patients clinical outcome is directly linked with PSD, and thus it really affect the patient's recovery, hospital stay, future dependency, disability and mortality[5,6]. There are many studies at international level, which show that depression is very common in stroke patients[2,3,7,8]. Though, very common in our society, but still there is very little data in literature search about this problem. To fill this gap in research about this clinical problem, we have conducted this study in the department of medicine, Khyber medical college Peshawar Pakistan. The main focus was to observe the

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incidence of depression in all patients presenting with strokes.

## MATERIALS AND METHODS

This descriptive, single centered and cross sectional study was carried out in medicine department, Khyber Teaching Hospital Peshawar. Total duration of study was 1- year, starting from January 01 2017 to 31st December 2017. Total 162 patient with stroke were enrolled in the study.

**Data collection:** After ethical approval from the ethical board all the stroke patients meeting the inclusion criteria were included. First, consent was taken, the purpose of the study conveyed and the already prepared questionnaire explained in detail. To control the confounders and bias in the study results, exclusion criteria was followed strictly. The demographics of all the patients were obtained through structured proforma and the record were kept confidential.

**Data analysis:** Data was analyzed using SPSS version 22. All the numerical values were expressed as mean ± SD while categorical values are expressed as frequency and percentages. Chi-square test was applied to find our any possible statistical association between different groups having depression. P-value less than 0.05 was considered significant with each valued tabulated as 2 tailed.

## RESULTS

Total 162 patients were observed to determine the frequency of depression among hospitalized stroke patients. The mean age was 73 years with SD ± 27.71. The characteristics of the study population are tabulated in table 1. The age was categorized into four groups 1, 2, 3 and 4. Where 15% (24) patients were there in age group 1(41-50 years), 26% (42) patients were in age group 2(51-60 years), 29% (47) were in group 3(61-70 years) and 30% (49) were from group 4 (71-80 years). The distribution of male and female patients were 60% (97) and 40% (65) respectively. 80% (130) patients have ischemic stroke while 20% (57) have hemorrhagic stroke. Depression was found in 35% of stroke patients. In order to find the impact of different age group, gender and type of stroke on depression, chi-square test was applied which shows no statistical significant association as summarized in table 2. The p-values of age group 41-50 vs 51-60, 61-70 and 71-80 were 0.9, 0.69 and 0.8 respectively. Patient with age group 61-70 years are 1.41 times more likely to develop depression as compared to other groups with OR 95% CI, 1.41 (0.50-3.98). The p-value for gender was 0.9 and type of stroke was 0.9 also.

**Table No.1: Characteristics of study population**

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Age | 41-50 years | 24 | 15% |
| | 51-60 years | 42 | 26% |
| | 61-70 years | 47 | 29% |
| | 71-80 years | 49 | 30% |
| Gender | Male | 97 | 60% |
| | Female | 65 | 40% |
| Type of stroke | Ischemic | 130 | 80% |
| | Hemorrhagic | 32 | 20% |
| Depression | YES | 57 | 35% |
| | NO | 105 | 65% |

Mean age was 73 years with SD ± 27.71

**Table No.2: Association of different variables with depression**

| Variables | | Depression | No depression | $x^2$ | OR (95%CI) | p-value |
|---|---|---|---|---|---|---|
| Age (years) | 41-50 | 9 | 15 | - | Reference | - |
| | 51-60 | 15 | 27 | 0.01 | 1.08 (0.38-3.05) | 0.9 |
| | 61-70 | 14 | 33 | 0.15 | 1.41 (0.50-3.98) | 0.69 |
| | 71-80 | 19 | 30 | 0.02 | 0.94 (0.34-2.59) | 0.8 |
| Gender (males vs females) | Males | 34 | 63 | 0.01 | 0.98 (0.51-1.90) | 0.9 |
| | Females | 23 | 42 | | | |
| Stroke (ischemic vs Hemorrhagic) | Ischemic | 46 | 11 | 0.09 | 1.04 (0.46-2.35) | 0.9 |
| | Hemorrhagic | 84 | 21 | | | |

# DISCUSSION

Stroke is known to be the disease of motor performance and the main stem of recovery is hospital care and rehabilitation. However, recent studies have focus on other aspects that greatly affects the post stroke life of a patient including cognition, behavior and emotion. This is the reason that depression is the most important complication of stroke that affect the quality of life of the patients[3,8-10]. Post stroke depression (PSD) is very common but usually left untreated which have had negative repercussions not only for patients but for the associated family members as well. Thus early diagnosis and treatment will improve recovery and overall quality of patients. The current study focused on the prevalence of PSD in total 162 patients visiting Khyber Teaching Hospital Peshawar Pakistan. The prevalence of PSD in our study was 35%. In consistent with an early study performed in Fortaleza, reported 40% PSD[11]. Our findings were similar to a meta-analysis published in 2013 reported the prevalence of PSD 31%[12]. Another meta-analysis published in the same year reported the prevalence of PSD 29%[13]. Population based cohort studies reported prevalence of PSD ranges from 2% to 55%[2,7,14,15]. In our study the percentage of female patients (35.3%) with PSD was slightly high as compared to those with male patients (35%) though the difference is not statistically significant but males are less likely to develop PSD (OR 95% CI 0.98 (0.51-1.90). Different studies have been published reporting high incidence PSD in females rather than males. Females are two times more likely to develop depression after stroke as compared to females[16,17]. We do not found any possible statistical association of PSD with increasing age but the results were shocking regarding PSD in different age groups, "the curvilinear effect" as there in high percentage of PSD in group 1 (37.5%) followed by decrease in percentage of PSD in middle and early old age group, 35.5% and 29.78% respectively and again increase in later old age which was 38.77%. Interestingly, a study published by Michael et al in 2016 reported similar pattern of PSD incidence in different age groups[18]. Further studies needs to be carried out to explore such curvilinear relationship.

The stroke patients are more depressed as compared to other diseases for example Folstein MF and colleagues reported that orthopedic patients are less depressed as compared to stroke patients with equal levels of functional disability (45% vs 10%)[19] and similarly by Carson AJ[20].

Despite great advances in medical era, the PSD is still very high. To overcome PSD proper counselling session may be conducted for the patient with psychologist / psychiatrist along with medical treatment with anti-depressant. Furthermore, proper follow-up is needed to determine the initial level of depression and post treatment depression level. Such studies are needed in this regards.

# CONCLUSION

Our study concludes that the incidence of depression is significant in-patient with stroke and is found in 35% of hospitalized stroke patients. Early diagnosis and treatment of depression will have a positive impact on the overall quality of patients with stroke.

**Author's Contribution:**

| | |
|---|---|
| Concept & Design of Study: | Bughdad Khan |
| Drafting: | Nafeedullah |
| Data Analysis: | Nizamuddin, Waheed Iqbal |
| Revisiting Critically: | Bughdad Khan, Nafeedullah |
| Final Approval of version: | Bughdad Khan |

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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