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**Original Article**

# The Frequency of Depression in Post Stroke Patients presenting at Outpatient Department of Abbasi Shaheed Hospital, Karachi

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## ABSTRACT

Post-stroke depression (PSD), is a recognized complication among of stroke survivals. Timely diagnosis and its management are particularly important in the reduction of stroke. **Objective:** To find out the frequency of depression in post stroke patients presenting at Outpatient Department of Abbasi Shaheed Hospital, Karachi. **Methods:** Cross-sectional study was carried out from 10/4/2018 to 10/9/2018. Sample size of 112 patients was calculated using the WHO software, by taking prevalence of depression 37.9 %, margin of error 9% and confidence level 'C.I'=95%. Ischemic stroke patients who fulfil the inclusion criteria were enrolled. Short history and demographics were entered in the Performa. Screening of depression was done on BDI score. Simple descriptive statistics with mean and standard deviation were used to provide quantitative data, whereas frequency and percentages were used to convey qualitative characteristics. To determine how these factors affected the outcome variable, effect modifiers were taken into account by stratification of age, gender, marital status, occupational status, socioeconomic position, and educational status. A chi square test was used after stratification, with a p-value of 0.05 considered significant. **Results:** Out of 112 patients, mean age with standard deviation and duration of disease were 47.14 ± 7.49 years and 18.72 ± 3.89 months respectively. 64 (57.1%) were male and 48 (42.9%) were female. Amongst patients with ischemic stroke, 52 (46.4%) had depression and 60 (53.6%) did not have depression, furthermore marital status, level of education and smoking appeared to be link with post stoke depression. **Conclusions:** Stroke patients represent a significant segment of population with unrecognized depression with different underlying factors.

## INTRODUCTION

Stroke the second commonest cause of death and was rated as third most common cause of combined death and disability in 2017 [1], approximate 5.5 million people died per year, causing disability among 50% of its survivals [2]. In United States, every 4th second a case of stroke occurs whereas every 4th minutes a death occurs [3]. Up till now no large-scale epidemiological studies have been done to estimate the actual incidence of stroke in Pakistan [4, 5]. Our papulation does not adequate knowledge of risk factors contributing towards stroke like diabetes [6]. There are multiple causative factors like hyperlipidemia, high blood pressures and smoking which lead to carotid artery stenosis, a major threat to stroke [7]. The estimated annual incidence of stroke in Pakistan is 250/100,0008. A corresponding linked has been found in many studies between intensity of recently diagnosed post stroke depression and stroke recovery outcome along with higher mortality [9-11]. Furthermore, use of antidepressants and psychotherapy resulting in better survival and quality of life [12-14]. Majority stroke survivors suffer from permanent

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physical and psychological disabilities. At 3-5 years, approximate 20-40% become functionally dependent for activities of daily living. Post stroke depression is reported to occur in 11-75% among stroke survivors. Major depression mostly occurs within the initial months after stroke in 10-27% of patients while 15-40% suffer from minor depression [15]. Depression ranks fourth at Global Burden of Diseases (GBD), approximately 3.8% of the population affected, including 5.0% among adults and 5.7% among adults older than 60 years [16]. Currently about 280 million people have depression globally [17]. Higher mortality has been reported among the patients of depression [18, 19] specifically among the patients with other medical diseases like stroke, diabetes and ischemic heart disease [21, 22]. Chances of depression get double among those who have chronic medical disorders [23]. Approximately 40% of stroke patients developed depression. Stroke impairs life's quality of its victims and their caregivers so more focused rehabilitation is needed to prevent further complications in terms of depression and other related disabilities. Neuro-biological characteristics such as area of infarcts and brain atrophy have also been related to depression after stroke, in addition to the psychosocial stress brought on by disability, loss of freedom, and decrease of quality of life [24]. The purpose of our study was to estimate the frequency of depression among stroke patients at Abbasi Shaheed Hospital, Karachi. Early recognition of depression provides an aid in intervention and management to reduce associated morbidities and mortalities among patients with depression. Result of my study was also provide current magnitude of depression in post stroke patients in our population.

## METHODS

After taking ethical approval from Abbasi Shaheed Hospital(letter No. MS/ASH/PS0364/2020, Dated 03-04-2018),Cross-sectional study was conducted at Medical Unit-III, Abbasi Shaheed Hospital, Karachi, from 10/12/2020 to 09/05/2021.The previously conducted study estimated the prevalence of post stroke depression at 37.9%24.The required sample calculated to be 112 patients using the WHO software, by taking prevalence of depression 37.9 %, margin of error 9% and confidence level 'C.I'=95%. Consenting stroke patients visiting outpatient department of Medical Unit-III, Abbasi Shaheed Hospital, Karachi, fulfilling the inclusion criteria were enrolled in the study. Brief history and demographic data were recorded from the patient and confirmed by attendant. The strokes patients were screen for depression on BDI screening tool which comprises of 21 items for depression and determine presence and degree of depression consistent with the DSM-IV. Each was rated from 0 to 3 according to severity of difficulty experienced. The BDI score ≥ 9 was interpreted as depression. Inclusion Criteria consisted diagnosed stroke patients of both genders, aged between 30 to 60 years, confirmed through CT-scan as hypo dense area with duration more than 6 months. Whereas exclusion criteria included non-consenting patients, those with history of hemorrhagic stroke, also patients with symptoms of mania, posttraumatic stress or bipolar effective disorder as well as patients already diagnosed as having depression or prior anti-depressant treatment were not enrolled. In addition to this, patient on any other drugs that may cause depression, significant hypernatremia (Na <130meq) patients with history of any other CNS disease (e.g. head trauma, multiple sclerosis) were not included. Patients with other systemic illness that may lead them to depression e.g. hypothyroidism, SLE or rheumatoid arthritis and patients with renal impairment, chronic obstructive pulmonary disease, chronic liver disease, congestive cardiac failure were excluded as well. Data analysis were done on SPSS Version 16.0. For quantitative variables like age and illness duration, the mean and standard deviation were determined. For qualitative variables including gender, married status, employment, educational attainment, socioeconomic status, and depression (yes/no), frequency and percentages were determined. To determine how these factors affected the outcome variable, effect modifiers were taken into account by stratification of age, gender, marital status, employment status, educational attainment, and socioeconomic level. A chi square test was used after stratification, with a p-value of 0.05 considered statistically significant.

## RESULTS

The mean age with standard deviation and the length of the illness, out of 112 patients, were 47.14 7.49 years and 18.72 3.89 months, respectively. 48 (42.9%) women and 64 (57.1%) men made up the group. In individuals who had an ischemic stroke, 52 (46.4%) developed depression and 60 (53.6%) did not; smoking, marital status, and educational status all seemed to be associated with post-stroke depression. Baseline characteristics of patients are shown in Table 1.

**Table 1:** Baseline characteristics of patients

| Characteristics | Total (n = 112) |
|---|---|
| **Gender** | |
| Female | 48 (48.46%) |
| Male | 64 (57.14%) |
| **Age (years)** | |
| Mean ± SD | 47.14 ± 7.49 years |

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| | |
|---|---|
| 30-40 years | 26(23.21%) |
| 41-50 years | 38(38.93%) |
| 51-60 | 48(48.8%) |
| **Marital status** | |
| Single | 63 (56.2%) |
| Married | 29 (25.9%) |
| Divorced | 08 (7.1%) |
| widow/widower | 12 (10.7%) |
| **Occupational status** | |
| Employed | 39 (75%) |
| Un- Employed | 12(25%) |
| **Marital status** | |
| Lower | 67(59.8%) |
| Middle | 32(28.6%) |
| Upper | 13(11.6%) |
| **Educational Status** | |
| Illiterate | 20(17.9%) |
| Primary | 22(19.6%) |
| Secondary | 36(32.1%) |
| Higher | 34(30.4%) |

Stratification for age, gender, occupational, marital, socioeconomic & educational status, smoking and history of CVA are mentioned in Table 2.

**Table 2:** Prevalence of PSD by patient's characteristics

| Characteristics | Post Stroke Depression (PSD) | | p-value |
|---|---|---|---|
| **Variables** | **Yes** | **No** | |
| **Gender** | | | |
| Male | 30 (57.7%) | 34(56.7%) | 0.53 |
| Female | 22 (42.3%) | 26 (43.3%) | |
| **Age** | | | |
| 30-40 years | 7(13.5) | 19 (31.7%) | 0.75 |
| 41-50 years | 20(38.5) | 18(30%) | |
| 51-60 | 25(48.1%) | 23(38.3) | |
| **Occupational Status** | | | |
| Employed | 39 (75%) | 40 (66.7%) | 0.22 |
| Un- Employed | 12(25 %) | 270(33.3%) | |
| **Marital Status** | | | |
| Married | 42(80.8%) | 21(35%) | 0.00 |
| Unmarried | 05(15.4%) | 49(28.3) | |
| Divorced | 01(1.9%) | 07(11.7%) | |
| Widow/Widower | 01(1.9%) | 11(18.3%) | |
| **Socioeconomic Status** | | | |
| Lower | 32 (61.5%) | 35 (58.3%) | 0.820 |
| Middle | 15 (28.8%) | 17 (28.3) | |
| upper | 05 (9.6%) | 08 (13.3%) | |
| **Educational Status** | | | |
| Illiterate | 11 (21.2%) | 09 (15%) | 0.01 |
| Primary | 12 (23.1%) | 10 (16.7%) | |
| Secondary | 21 (40.4%) | 15 (25%) | |
| Higher | 08 (15.4%) | 26 (43.3%) | |
| **Smoking** | | | |
| Yes | 38 (42.2%) | 32 (40%) | 0.044 |
| No | 52 (57.8%) | 48 (60%) | |
| **CVA History** | | | |
| Yes | 18 (20%) | 23 (28.8%) | 0.12 |
| No | 72 (80%) | 57 (71.2%) | |

Post stratification chi square test was applied taking p-value of ≤0.05 as significant

*Statistically significant at 5% level of significance

## DISCUSSION

Stroke ranks third among leading cause of mortalities globally, is the common neurological reason for morbidity and mortality across the globe. Determination of stroke risks in population is not only relevant for healthcare providers but it is also important to identify persons at higher risk and to initiate proper management. Fortunately, there have been progressive decreases in mortalities secondary to stroke, consequently prompting an expansion in number of survivors with lingering hindrances and handicaps that have been joined by a more noteworthy interest in the elements that might disrupt utilitarian result and personal satisfaction. Depression is thought to be the most important factor that can be used to predict poor quality of life among stroke patients. Post-stroke depression (PSD) tops the list among of emotional disorders affecting stroke patients. Many demographic factors have their role to play towards post stroke depression as well. In Our study among 112 diagnosed patients of ischemic stroke patients 52 (46.4%) had depression. In addition to this, marital status, level of education and smoking appear to be significant contributing factor whereas there was no statistically significant difference in gender, age, occupation, socioeconomic status and history of previous stroke. Study conducted at Lahore showed that 37.9 % of patients had post stroke depression and similar to our study age and gender didn't appear to be responsible for depression [24]. Very similar results were reported from another study from Lahore that showed depression among 37% of stroke survivals [25]. Whereas study from Peshawar showed much higher prevalence of post stroke depression, 71.9% [26]. Similar studies were carried out abroad, Alborg Hospital Denmark, Netherlands and Louisville and their results showed 41%, 37.8% and 36.4% patients had depression following the stroke respectively [27-29]. Desmond *et al.*, found percentage of depression to be 11.2%, furthermore it was determined that severe form of stroke particularly involving the areas like limbic system will likely lead to depression [30]. Eriksson *et al.*, reported

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depression was prevalent among 12.4% and 16.4% of males and females respectively following stroke [31]. Hayee *et al.*, used Beck's Depression Inventory (BDI) scale and analyzed a total of 297 first-ever strokes patients for period of 1 year, at the 3rd month and at 12th, 41% of patients were depressed and at the 12th month 42% were depressed [32]. Bayer *et al.*, concluded the frequency of depressive illness among stroke victims to be 40.1% [33]. Similar to our study, a study conducted at Egypt reported smoking and educational status as responsible factor although with overall lower prevalence of depression ,37% among stroke patients [34].

## CONCLUSIONS

Stroke patients represent an enriched population for undiagnosed depression. It is the most incessant neuropsychiatric illness of brain ischemia, influencing up to 52% of every such understanding. The relationship between disability and PSD may reflect its impact on stroke patients' physical impairment, cognition, and social reintegration, as well as its potential delay in recovery. It is, consequently, fitting for the clinicians to evaluate all ischemic stroke patients for wretchedness to lessen their drawn-out morbidity and mortality.

## Authors Contribution

Conceptualization: SJ
Methodology: SJ, MS
Formal analysis: MS, SJ, SB, MNAK
Writing-review and editing: MS, SJ, SB, MNAK

All authors have read and agreed to the published version of the manuscript.

## Conflicts of Interest

The authors declare no conflict of interest.

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