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Prevalence of depression among post-stroke survivors in South Asian Region: A narrative review

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Abstract

Stroke is the third biggest reason for mortality and has a massive emotional effect on clients and the members of their family. Depression is a debilitating complication of stroke, with repeated occurrences of depressive ailments after the stroke. Prevalence of post-stroke depression (PSD) has always remained unknown and is a disabling entity among the stroke survivors. **Objective:** The aim of this narrative review is to determine the prevalence of depression among post-stroke survivors. **Methods:** A comprehensive literature search was made in the following databases such as the Web of Science, PubMed-Medline, CINAHL, Scopus, J gate, and IndMED for studies between 2005 and 2016, which provided the prevalence data for depression among post-stroke survivors. **Results:** The number of hits from the database search comprised 1,243 studies, out of which nine studies were included in this review. It was found that there were disparities in the prevalence among the different studies. **Conclusion:** PSD is an emotional disorder that usually affects patients with stroke. The study of the prevalence of PSD at an initial stage is very essential for its timely treatment to enhance the results of the rehabilitative process of stroke patients. This narrative review provides a clear estimate of the burden of depression in South Asian Region among post-stroke survivors.

Key words: Depression, post-stroke depression, prevalence, post-stroke survivors

Introduction

Stroke is the third biggest reason for mortality and has a massive emotional effect on clients and the members of their family and is the most common reason of severe bodily disability (Rajashekar, Pai, Thunga, & Unnikrishnan, 2013) affecting approximately 40% of the patients. Many studies show that in addition to the psychosocial stress, neurobiological factors such as site of infarct and brain atrophy may also be related to Post Stroke Depression (PSD). Depression is a debilitating complication of a stroke with repeated occurrences, ranging from 18% to 61% of depressive disorders among the stroke survivors (Rajashekar, Pai, Thunga, & Unnikrishnan, 2013) affecting approximately 40% of the patients. Many studies show that in addition to the psychosocial stress, neurobiological factors such as site of infarct and brain atrophy may also be related to Post Stroke Depression (PSD). PSD is a serious complication and initial or late stages of significant symptoms of

depression are reported by about one third of stroke survivor's. The current advances in modern medical and evolving life expectancy have led to a reduction in mortality and the succeeding upsurge in patients having strokes with disabilities and impairment, which affects the survivor's quality of life significantly. Studies suggest that people with stroke having depression is dramatically more predominant and is related to the total population (Ariful Islam, Rahman, Aleem & Islam, 2016).

The significance of this review

Stroke prevalence is escalating in countries that are developing due to a greater incidence, increasing risk factors, and advancing age. Around the globe, prevalence of PSD varies widely, and in reports, this varied disparity is due to causes including ethnicity, sample size, assessment, and the intervals between strokes and in the selection of case and tools used and their methodological differences; hence the accurate prevalence of PSD remains arguable (Paul et al., 2013) essential to determine its prognosis, are lacking from developing countries. This prospective study was undertaken to assess the prevalence, natural history, and correlates of depression among SS in an Indian

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community. Methods: From a community based stroke registry, SS were assessed annually for cognition, disability, and depression using Bengali validated scales. PSD was diagnosed if score on geriatric depression scale was greater than or equal to 21. Complex sample strategy was considered when calculating prevalence of post stroke depression. An age- and sex-matched case-control study was undertaken to determine the odds of depression in SS. Results: Prevalence of PSD was 36.98% (95% confidence interval [CI]: 31.89%-42.06%. There is disparity in the prevalence reported among different studies. PSD is a routine consequence that is deteriorating and disabling the prognosis, hence, its study is of crucial importance to prevent its future and unfavourable consequences among stroke survivors. Thus, this study is aimed to determine the prevalence of depression among post-stroke survivors in South Asian Region.

Methods and materials

Inclusion criteria: A comprehensive electronic literature search was made in the following data bases, such as

Web of Science, PUB MED - Medline, CINAHL, Scopus, J gate, and Indmed for studies between 2005 and 2016, with the full version available and studies written in English only, providing prevalence data for depression among post-stroke survivors.

Data extraction and study design: As per the objective, data was extracted and evaluated from the included studies and a narrative analysis was adopted to write this review. The eligibility of the papers to be included was determined by two reviewers. The number of hits from the data base search comprised 1,243 studies, out of which nine studies were included in this review.

Search strategy: The search strategy included the use of terms such as stroke survivors, patient, client, subjects, participants, adults, stroke, CVA, depression, depressive disorder, prevalence, incidence, trends, frequency, cross-sectional, descriptive, observational, post-stroke depression, depression among stroke survivors, post-stroke mood disorder, South Asia, India, Afghanistan,

Table1:

The Literature from 2005- 2016 Retrieved for The Review on Prevalence of Depression Among Post-Stroke Survivors in South Asian Region

Author and year	Research design	The objective of the study	Sample and sample size	Outcome measures	Study findings
Bose and Shah, 2012	Cross-Sectional study	To determine the depression levels in survivors with stroke	Study participants were 100, who had first ever stroke attack and had completed at least two weeks after the attack.	Zung Self Rating Depression Scale	On Zung Self-Rated Depression scale, stroke patients had moderate (60-69) to severe scores (>70). Among the right-sided stroke survivors, levels of depression were significantly higher ($p<.05$).
Islam et al. 2016	Cross-sectional study	Prevalence rate of depression and its related factors among stroke survivors	164 post-stroke survivors going to 2 hospitals in Dhaka city	Hamilton Depression Rating Scale	70 was the reported prevalence of depression and severe depression was stated among 32%. Depression is reported as an important health problem among the patients with stroke.
Khalid et al. 2016	Sequential mix methods approach which included quantitative analytical cross-sectional study and sequential qualitative interviews and discussion	Quality of life after stroke in Pakistan	Among 700 participants constituting 350 stroke patients and caregiver dyads	Stroke Specific Quality of Life Scale (SSQOLS) and quality of life (QOL) of caregivers was measured through RAND-36	164.18 ± 32.30 was the mean SSQOLS score. QOL of stroke patients were negatively impacted by depression, severe functional disability, severe neurologic pain, and hospital admissions.

Author and year	Research design	The objective of the study	Sample and sample size	Outcome measures	Study findings
Raju et al. 2010	Prospective hospital-based study	To assess anxiety, QoL, functional independence and depression of stroke patients and its relationship with the characteristics of stroke	One hundred sixty-two patients with one-month post-stroke were interviewed.	World Health Organization QoL-BREF, Hospital Anxiety Depression Scale and Functional Independence Measure. National Institute of Health Stroke Scale and modified Rankin scale	The reported mean age was 54.3 - 12.9 years and mean score of National Institute of Health Stroke Scale was 2.1. Presence of depression, anxiety, and functional dependence were predictors of impaired QoL. 39 patients had anxiety (24%) and 60 (37%) had depression. Functionally dependent had a severe stroke and were more likely to be older.
Rajashekaran et al. 2013	Hospital-based cross-sectional study	To evaluate the need of lesion location in post-stroke depression	Patients with their first ever stroke, sixty-two were interviewed.	Montgomery Asberg Depression Rating Scale, Scales of Beck Depression Inventory and Minimal state examination, Barthel Index and Neuroimaging	28 subjects were diagnosed with PSD, left-sided lesions were found in 19. Cortical infarcts and left-sided sub cortical infarcts presented significant association with post-stroke depression.
Srivastava et al. 2010	Cross-sectional descriptive study	Prevalence among chronic stroke patients about depressive disorder and the relationship of post-stroke depression with disability	Supratentorial 185 stroke patients were screened and 73 of them met the criteria for inclusion, 51 patients were involved in the study.	Demographic data, data on stroke, cognition (minimal state examination), ambulatory status (Functional Ambulation Category), Hamilton Depression Rating Scale-(HRDS) depressive ideation, balance (Berg Balance Scale), walking ability (speed), impairment (Scandinavian Stroke Scale), and independence (Barthel Index) in activities of daily living.	35.29% had depression. Demographic variables were highly correlated with PSD ($p < .05$). Depression was unrelated to lesion-related parameters and was related to post-stroke functional disability ($p > .05$).

Author and year	Research design	The objective of the study	Sample and sample size	Outcome measures	Study findings
Paul et al. 2013	Prospective cohort study a case-controlled study nested within the cohort study	To determine the prevalence, history, and correlation of depression and association between stroke and depression.	Community-based stroke registry among 853 stroke survivors.	Cognition, depression, and disability were measured using Bengali validated scales. PSD was detected if the geriatric depression scale score was ≥ 21 .	Prevalence of PSD was 36.98% among 241 patients. About 17% developed depression per annum. The highest rate of PSD was 3- 18 months after stroke. Mortality in PSD was twofold than in patients who were not depressed. When compared to controls, 19.95 was the odds ratio.
Qamar 2011	Cross-sectional study	To identify the prevalence and to assess the relationship between demographic data and post-stroke depression and stroke characteristics and post-stroke depression	Carried out at Liaquat University Hospital, Hyderabad, Pakistan among 81 patients	Using the DSM IV-TR criteria	The criteria for depression was met by 31 (38%). Young age, primary level of education, male gender, unemployment, and low monthly income were significantly associated with PSD (p -value $< .05$) and ischemic stroke type (p -value $< .05$).
Khan et al. 2012	Cross-sectional study	Repeated vascular events and functional, cognitive, and psychological outcomes among stroke patients in Pakistan	309 stroke survivors	Interviewed using standardized scales. A verbal autopsy for those who expired after discharge. From the medical records, stroke subtype, and risk factors data was obtained.	The stroke survivors died from repeated vascular events were 12.3%. Poor functional outcome (modified rank in a score of > 2 and a Barthel index score of < 9) was reported in 51%. Poor functional outcome predictors were older age, moderate to severe dementia, diabetes and multiple complications after stroke. Cognitive outcomes were poor in 42% and depression, multiple post-stroke complications, the presence of bed sores, and history of atrial fibrillation were predictors of moderate to severe dementia.

Nepal, Bhutan, Sri Lanka, Bangladesh, Pakistan, and Maldives.

Results and discussion

There were very limited studies published on the prevalence of depression among post-stroke survivors. Totally, nine studies were identified, and the study details are described in Table 1. The studies included a cross-sectional study, sequential mix methods approach, prospective hospital-based study, cohort study and a case-controlled study nested within the cohort study.

A Cross-sectional study conducted among 100 participants, from various hospitals in Mumbai and Navi Mumbai, who had their first stroke and had completed at least two weeks after the attack, revealed

to have (60-69) moderate to (70 and above) severe scores. Patients who had left hemispheric involvement had right-sided stroke ($p < .05$) and were found with suggestively higher levels of depression. The reason for the stroke, the manifestation of multiple risk factors, gender, number of arteries involved in ischemic stroke, did not show any significant depression among patients with stroke. Among the participants, depression levels ranged majorly from moderate (28%) to severe (42%) i.e. 60-69 and 70 and above, respectively (Bose & Shah, 2012).

Among 164 survivors post-stroke attending two hospitals in Dhaka city, Bangladesh, factors connected with depression were analyzed and the prevalence of depression was 70% and 32% of the survivors were

found to have severe depression. Factors including joint family living, those with comorbid dysphasia and hypertension and those not able to do daily activities by themselves were found to be significantly associated with depression (Ariful Islam et al., 2016).

A study conducted on 350 stroke survivors and their caregivers in two tertiary hospitals in Pakistan revealed that 70% suffered post-stroke complications and 60% had depression. The stroke survivor's median age was 59(17) years, with 68% of male. Severe functional disability, depression, hospital admissions and severe neurologic pain were found to affect the QOL of stroke survivors negatively. Primary caregivers of the stroke survivors were found to be frustrated, depressed, disappointed, and isolated by health services. Whereas, caregivers, who were young, felt overwhelmed, depressed, isolated, and were delivering care at a high personal cost (Khalid et al., 2016) who bear two thirds of the global stroke burden.

METHODOLOGY: We used a sequential mix methods approach. First, a quantitative analytical cross-sectional study was conducted on 700 participants, who constituted 350 stroke survivor and their caregiver dyads. QOL of stroke survivor was assessed via Stroke Specific Quality of Life Scale (SSQOLS).

A prospective hospital-based study in the Neurology and Stroke Clinics of CMC Hospital, Ludhiana, Punjab, revealed that out of 162 patients, 37% had depression and 24% had anxiety. It was seen mostly in older patients who were functionally dependent and had a stroke. Presence of depression, functional dependence, and anxiety was associated with decreased QOL and had a little prevalence of depression and anxiety (Raju, Sarma & Pandian, 2010).

The study conducted among stroke survivors at the local inhabitants in and around Mangalore district of Karnataka revealed that depression is a consequence of stroke, which affects around 40% of the patients. Moreover, neurobiological factors such as the site of brain atrophy and infarct, the psychosocial stress may be related to PSD (Rajashekar et al., 2013) affecting approximately 40% of the patients. Many studies show that in addition to the psychosocial stress, neurobiological factors such as site of infarct and brain atrophy may also be related to Post Stroke Depression (PSD). In a cross-sectional, descriptive study,

demographic variables such as male gender, urban region, married, nuclear family, and increased HRDS score was correlated with post-stroke depression significantly ($P < 0.05$). Depression was associated with functional disability and was unrelated to lesion related parameters. The study revealed that the majority of chronic stroke survivors suffer from depression and it is prevalent in inpatients sent for rehabilitation. PSD is associated with demographic variables principally and to some extent, functional disability following a stroke (Srivastava, Taly, Gupta & Murali, 2010).

A prospective study in Kolkata revealed the prevalence of PSD was 36.98% among 241 patients. About 17% developed depression yearly and 3- 18 months post-stroke was the peak rate of PSD. Subjects with PSD were significantly older, had education, suffered the first stroke at an older age, had greater cognitive impairment, lower socioeconomic status, and disability. In PSD, mortality was approximately double than in patients with no depression. (Paul et al., 2013) essential to determine its prognosis, are lacking from developing countries. This prospective study was undertaken to assess the prevalence, natural history, and correlates of depression among SS in an Indian community. Methods: From a community based stroke registry, SS were assessed annually for cognition, disability, and depression using Bengali validated scales. PSD was diagnosed if score on geriatric depression scale was greater than or equal to 21. Complex sample strategy was considered when calculating prevalence of post stroke depression. An age- and sex-matched case-control study was undertaken to determine the odds of depression in SS.

Results: Prevalence of PSD was 36.98% (95%) confidence interval [CI]: 31.89%-42.06%.

In a cross-sectional study of the Neurology OPD of the Liaquat University Hospital, Pakistan, depression criteria were met by 81 patients. Demographic variables such as male gender, young age, primary education, low monthly income, unemployment, ischemic stroke type were significantly associated with PSD, but were not associated with lesion location (Qamar, 2012).

A study among patient from the AKUH Karachi, Pakistan, found that stroke patients had negative results in the community despite the advanced disability. Principle caretakers in the family were seldom reinforced by healthcare professionals, stressing the necessity to develop strong support to home-based

care for caregivers in these poor settings (Khan et al., 2012) cognitive and vascular morbidity and mortality of Pakistani stroke survivors discharged from a dedicated stroke center within a nonprofit tertiary care hospital based in a multiethnic city with a population of more than 20 million.

METHODS: Patients with stroke, aged > 18 years, discharged alive from a tertiary care centre were contacted via telephone and a cross sectional study was conducted. All the discharges were contacted. Patients or their legal surrogate were interviewed regarding functional, cognitive and psychological outcomes and recurrent vascular events using standardized, pretested and translated scales. A verbal autopsy was carried out for patients who had died after discharge. Stroke subtype and risk factors data was collected from the medical records. Subdural hemorrhages, traumatic ICH, subarachnoid hemorrhage, iatrogenic stroke within hospital and all other diagnoses that presented like stroke but were subsequently found not to have stroke were also excluded. Composites were created for functional outcome variable and depression. Data were analyzed using logistic regression.

RESULTS: 309 subjects were interviewed at a median of 5.5 months post discharge. 12.3% of the patients had died, mostly from recurrent vascular events or stroke complications. Poor functional outcome defined as Modified Rankin Score (mRS). It is recommended to conduct future researches to identify the exact prevalence of PSD and a systematic review would be valuable to obtain the pooled prevalence of PSD in South Asian region.

Conclusion: PSD is a disorder that commonly affects stroke sufferers. Identifying the prevalence of PSD at an initial stage is important to improve the outcomes of the rehabilitative process of stroke survivors and for its early intervention. This narrative review provides a clear estimate of the burden of depression in the South Asian Region among post-stroke survivors. PSD often remains unrecognized and is associated with many factors such as increased mortality, cognitive impairment, and increased disability, the risk of falls, and the rehabilitation outcomes are worse.

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