Short Communication

Depression among Rural Stroke Survivors: A Cross-Sectional Study

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Abstract

Background: Depression is a major neuropsychiatric complication of stroke. Poststroke depression (PSD) can lead to inadequate functional recovery, social withdrawal, poor quality of life, and suicidal ideations. **Objective:** The study explored the PSD among stroke survivors. **Materials and Methods:** A cross-sectional survey was conducted among 151, purposively selected rural stroke survivors of Kozhikode district, Kerala, India. Patient health questionnaire-9 (PHQ-9) was used to assess PSD. **Results:** The age of participants ranged from 28 to 80 years with a mean (standard deviation) age of 64.58 (10.3) years. The majorities of the participants were males (53.6%), had an ischemic stroke (76.2%), and had left-sided brain lesions (75.5%). The median (interquartile range) depression scores on PHQ-9 were 9 (12–6). Most of the participants had either mild (47%), moderate (21.2%), or moderately severe depression (11.9%). Low energy, sleep disturbances, low self-esteem, and anhedonia were the common depressive symptoms experienced by the stroke survivors. **Conclusions:** High prevalence of undiagnosed depression remains as a significant challenge to primary care.

Keywords: Patient health questionnaire, poststroke depression, stroke

Introduction

Stroke is a major cause of neurological mortality and morbidity. In India, the prevalence of stroke ranges from 84 to 424/100,000, and it accounts for about 13.3% of disability-adjusted life years lost.[1]

Stroke survivors experience a range of emotional and behavioral disturbances. Depression is one such major neuropsychiatric problem, and it occurs due to psychological reactions to clinical consequences of stroke, changes in the level of neurotransmitters, or due to social isolation.[2]A recent systematic review showed that the prevalence of poststroke depression (PSD) is 29%, and it can remain steady up to even 10 years after stroke.[3]In addition, Bose and Shah identified that stroke survivors had moderate-to-severe depression and also found that patients with left hemispheric stroke had more depression as it impairs activities of daily living among those with right side dominancy.[4]

PSD is of prime clinical importance as it can lead to inadequate functional recovery, social withdrawal, poor quality of life, and suicidal ideations.[5-8] In addition, untreated PSD is found to impact the rehabilitation process adversely.[9] Therefore, early detection of PSD and treatment is vital to increase autonomy, optimize recovery, and improve the quality of life. Nonetheless, there is a paucity of studies that have explored PSD among the Indian population. Hence, the present study aims to measure depression among stroke survivors from a selected rural population of Kerala.

Materials and Methods

A cross-sectional study was conducted among purposively selected 151 stroke patients from rural primary care settings of Kozhikode district, Kerala. Subjects of age group 25–80 years and who had a stroke (an ischemic or hemorrhagic unilateral) within the past 1 year were included in the study. Those with

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cognitive deficits, dysphasia, and depression prior to stroke were excluded from the study. The data were collected at the households of the participants, and the data collection period was from July 2019 to September 2019. This article is part of a large community-based study on stroke rehabilitation. The scope of this article is limited to the exploration of depression among stroke survivors.

A demographic-clinical data questionnaire and patient health questionnaire-9 (PHQ-9) were used for data collection. PHQ-9 is a self-administered nine-item questionnaire widely used to assess the presence and severity of depression.[10] The nine attributes of depression measured by PHQ-9 are anhedonia, feelings of depression, sleep problems, low energy, appetite problems, low self-esteem, trouble concentrating, psychomotor problems, and suicide ideations.[11] The responses for each item are coded on a 4-point scale (0 – not at all, 1 – several days, 2 – more than half the days, and 3 – nearly every day). Overall scores are obtained by adding the scores of each item with a minimum possible score of 0 and a maximum score of 27. Higher the scores represent greater levels of depression, and based on the overall scores, the severity of depression is classified as minimal depression (0–4), mild depression (5–9), moderate depression (10–14), moderately severe depression (15–19), and severe depression (20–27). The scale demonstrates excellent psychometric properties with high internal consistency reliability (Cronbach's alpha of 0.89) and high sensitivity for detecting PSD.[12,13] The English version of the scale was translated to Malayalam (local language) by a bilingual language expert, and then, it was back translated to English by another expert. The original and back-translated versions were found to be similar, and the translated Malayalam version was deemed appropriate for data collection. PHQ-9 is exempted from copyright restrictions and is free to download and use.[14]

The Institutional Ethics Committee of the Institute of Palliative Medicine, Kozhikode, Kerala, granted ethical approval for this study. Written informed consent was obtained from the study participants.

Results

Among 151 stroke survivors, 81 (53.6%) were male and 70 (46.4%) were female. The age of participants ranged from 28 to 80 years with a mean (standard deviation) age of 64.58 (10.3) years. Among the participants, 19 (12.5%) belonged to the age category of 28–54 years and 132 (87.5%) belonged to the age category of 55–80 years. One hundred and fifteen (76.2%) had ischemic stroke and only 36 (23.8%) had hemorrhagic stroke. Seventy-eight (51.7%) participants had stroke within the past 6 months, whereas 73 (48.3%) had stroke prior to 6 months. The location of lesion was left for 114 (75.5%) participants and right for 37 (24.5%). Only seven participants (4.6%) were taking antidepressants.

The overall score of PHQ-9 was obtained by adding individual item scores. The normality of the data from the depression scale was analyzed using the Shapiro–Wilk test and the corresponding $P < 0.05$, indicated a nonnormal distribution. The median (95% CI) depression scores on PHQ-9 were 9 (8.01–9.35) with an interquartile range (IQR) of 12-6. A median score of 9 in PHQ indicates that most of the participants under study had mild depression.

Table 1 shows the category-wise distribution of depression among stroke survivors. Minimal depression was found in 30 (19.9%) of participants. Majority 71 (47%) had mild depression. Almost 32 (21.2%) and 18 (11.9%) of stroke survivors had moderate and moderately severe depression, respectively. A severe level of depression was not seen among the participants. The PHQ score of ≥10 denotes a clinical diagnosis of depression.[12] In the study, we found that almost 50 participants (33.1%) had a score of ≥10 , indicating that almost one-third of stroke survivors experience PSD.

A detailed item-wise analysis was done to explore the attributes contributing to depression which are represented in Table 2. Majority of the participants (34.4%) felt low energy, nearly every day. About 57 (37.7%) had problems with sleep in more than half the days, indicating sleep as a major concern among stroke survivors. About 49 (32.4%) had feelings of depression for more than half the days. Low self-esteem was experienced by 69 (45.7%) in several days. Overall, it was found that having low energy, sleep disturbances, low self-esteem, and anhedonia were common problems experienced by stroke survivors. Even though it was reassuring to note that suicidal ideations were absent in majority, those who present with this issue need clinical attention and treatment. Stroke survivors did not commonly manifest problems with appetite or concentration.

Chi-square test and Fisher's exact test were performed to find the association between depression and selected demographic variables. However, it was found that PSD is not associated with age, gender, duration of stroke, type of stroke, and side of the lesion.

Discussion

Depression is a major neuropsychiatric complication of stroke. The median (IQR) depression scores were 9 (12-6). Almost 33.1% of participants had moderate (n = 32; 21.2%) to moderately severe depression (n = 18; 11.9%). The item-wise analysis shows that stroke survivors experienced low energy (31.8%), problems with sleep (37.7%), and feelings of depression (32.4%) for more than half the days. Low self-esteem was experienced by 69 (45.7%) in several days.

Table 1: Distribution of level of depression among stroke survivors (n=151)

Level of depression (score)	n (%)
Minimal (0-4)	30 (19.9)
Mild (5-9)	71 (47.0)
Moderate (10-14)	32 (21.2)
Moderately severe (15-19)	18 (11.9)

Table 2: Item-wise responses of participants to patient health questionnaire-9 (*n*=151)

Item attribute	Not at all, *n* (%)	Several days, *n* (%)	More than half the days, *n* (%)	Nearly every day, *n* (%)
Anhedonia	62 (41.1)	39 (25.8)	43 (28.5)	7 (4.6)
Depressed	33 (21.9)	63 (41.7)	49 (32.4)	6 (4.0)
Sleep problems	45 (29.9)	26 (17.2)	57 (37.7)	23 (15.2)
Low energy	22 (14.6)	29 (19.2)	48 (31.8)	52 (34.4)
Appetite problems	118 (78.1)	7 (4.6)	20 (13.2)	6 (4.1)
Low self-esteem	29 (19.2)	69 (45.7)	32 (21.2)	21 (13.9)
Trouble concentrating	94 (62.3)	38 (25.2)	19 (12.5)	-
Psychomotor problems	88 (58.3)	36 (23.8)	27 (17.9)	-
Suicide ideation	131 (86.8)	6 (4.0)	8 (5.2)	6 (4.0)

Suicidal ideations were present in a minor proportion of stroke survivors. Stroke survivors rarely manifested problems with appetite and concentration. PSD was not associated with age, gender, type of stroke, duration of stroke, and side of the lesion.

The current study found that the majority of stroke survivors experience PSD. Most of the participants had either mild (47%), moderate (21.2%), or moderately severe depression (11.9%). However, severe depression was not seen in any of the participants. These findings were supported by several studies conducted across the globe. Berg *et al*. found that even though 27% of stroke patients experience depressive symptoms, only 5.6% exhibit features of major depression.[15] These findings are in line with the study by Paolucci *et al*. wherein the majority of the stroke survivors were found to experience only minimal depression with dysthymia (80.17%).[16] Similarly, Oni *et al*. found that moderate depression was common among stroke survivors (62.5%) and only a minor proportion (6.3%) were found to experience severe depression.[17]

A PHQ-9 score of ≥10 has a 78% sensitivity and 96% specificity for making a clinical diagnosis of depression.[18] In our study, a score of ≥10 in PHQ-9 was seen in 33.1% of participants. This indicates that almost one-third of stroke survivors were depressed. Our findings were in accordance with the findings of a systematic review by Ayerbe *et al*. where the prevalence of depression was found to be 29% (95% confidence interval [CI]: 25–32).[3] On the contrary, a study by Almhdawi *et al*. found a high prevalence (74.5%) of depressive symptoms among individuals with stroke.[19]

As per the treatment recommendations, a patient with moderate depression (PHQ score 10–14) requires counseling and or pharmacotherapy, those with moderately severe depression (PHQ score 15–19) require psychotherapy along with pharmacotherapy, and those with severe depression (PHQ score 20–27) would require immediate initiation of pharmacotherapy and referral to mental health specialists.[10] Even though 33.1% of the study sample would require either pharmacological or nonpharmacological measures to combat depression, it was alarming to note that only a small proportion of the study participants were receiving antidepressants. This calls for attention and highlights the need for screening depression among stroke survivors.

Low energy was experienced by 85.4% of participants from several days to almost every day. In an extensive literature review, Choi-Kwon and Kim found that the prevalence of poststroke fatigue ranges from 23% to 75%.[20]A similar trend was observed by Ingles *et al*. where 68% of stroke survivors were found to experience fatigue.[21] In our study, about 13% of participants reported experiencing suicidal ideations from several days to almost every day. Similar findings were found by Williams *et al*. who report a 10% prevalence of suicidal ideation among stroke survivors.[18]

There are several strengths to our study. While most of the studies explore PSD in clinic-based population, our study was conducted in a rural primary care setting. We excluded patients with a history of depression prior to the stroke so that the depressive symptoms found in this study participants could be attributed to stroke. It was found that depression is a significant problem among stroke survivors; hence, there is a need for screening and assessment of depressive symptoms.

The results reported herein should be considered in light of some limitations. The study was cross-sectional in nature and did not focus on long-term changes in depression among stroke survivors. Depression could be linked to other factors such as the size of the lesion, level of disability, sociocultural factors, and family support, which were not addressed in this study.

Conclusion

This study provides insight into depressive symptoms among stroke survivors. The study found that almost one-third of the participants had moderate or moderately severe depression. The high prevalence of undiagnosed depression remains as a significant challenge to primary care and PSD remains like the tip of an iceberg. Treating depression would indirectly improve the quality of life, functional ability, and aid in the recovery process. Screening for depressive symptoms could be included in the routine follow-up of stroke patients. Strategies such as psychotherapy, counseling, and pharmacotherapy may be utilized to support the patients. Psychiatric referral services may be utilized for those with major depression. Early recognition and management of PSD is highly essential to enhance functional recovery and improve the quality of life.

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Conflicts of interest
There are no conflicts of interest.

References
1. Pandian JD, Sudhan P. Stroke epidemiology and stroke care services in India. J Stroke 2013;15:128-34.
2. Wang Z, Shi Y, Liu F, Jia N, Gao J, Pang X, *et al*. Diversiform etiologies for post-stroke depression. Front Psychiatry 2018;9:761.
3. Ayerbe L, Ayis S, Wolfe CD, Rudd AG. Natural history, predictors and outcomes of depression after stroke: Systematic review and meta-analysis. BJPsych Int. 2013;202:14-21.
4. Bose M, Shah P. Analysing post stroke depression (PSD) levels in stroke patients using zung self-rating depression scale. Indian J Physiother Occup Ther 2012;6:187-90.
5. Chemerinski E, Robinson RG, Kosier JT. Improved recovery in activities of daily living associated with remission of poststroke depression. Stroke 2001;32:113-7.
6. Llorca GE, Castilla-Guerra L, Moreno MF, Doblado SR, Hernández MJ. Post-stroke depression: An update. Neurología (English Edition) 2015;30:23-31.
7. Jönsson AC, Lindgren I, Hallström B, Norrving B, Lindgren A. Determinants of quality of life in stroke survivors and their informal caregivers. Stroke 2005;36:803-8.
8. Eriksson M, Glader EL, Norrving B, Asplund K. Poststroke suicide attempts and completed suicides: A socioeconomic and nationwide perspective. Neurology 2015;84:1732-8.
9. Ahn DH, Lee YJ, Jeong JH, Kim YR, Park JB. The effect of post-stroke depression on rehabilitation outcome and the impact of caregiver type as a factor of post-stroke depression. Ann Rehabil Med 2015;39:74-80.
10. Kroenke K, Spitzer RL. The PHQ-9: A new depression diagnostic and severity measure. Psychiatr Ann 2002;32:509-15.
11. Lee EJ, Hall LA, Moser DK. Psychometric properties of the patient health questionnaire-9 in patients with heart failure and gastrointestinal symptoms. J Nurs Meas 2014;22:29-40.
12. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med 2001;16:606-13.
13. Manea L, Gilbody S, McMillan D. Optimal cut-off score for diagnosing depression with the Patient Health Questionnaire (PHQ-9): A meta-analysis. CMAJ 2012;184:E191-6.
14. Phqscreeners.com. 2020. Terms of Use. Available from: https://www.phqscreeners.com/terms. [Last accessed on 2020 Mar 10].
15. Berg A, Palomäki H, Lehtihalmes M, Lönnqvist J, Kaste M. Poststroke depression in acute phase after stroke. Cerebrovasc Dis 2001;12:14-20.
16. Paolucci S, Gandolfo C, Provinciali L, Torta R, Toso V, DESTRO Study Group. The Italian multicenter observational study on post-stroke depression (DESTRO). J Neurol 2006;253:556-62.
17. Oni OD, Olagunju AT, Olisah VO, Aina OF, Ojini FI. Post-stroke depression: Prevalence, associated factors and impact on quality of life among outpatients in a Nigerian hospital. S Afr J Psychiatr 2018;24:1058.
18. Williams LS, Brizendine EJ, Plue L, Bakas T, Tu W, Hendrie H, *et al*. Performance of the PHQ-9 as a screening tool for depression after stroke. Stroke 2005;36:635-8.
19. Almhdawi KA, Alazrai A, Kanaan S, Shyyab AA, Oteir AO, Mansour ZM, *et al*. Post-stroke depression, anxiety, and stress symptoms and their associated factors: A cross-sectional study. Neuropsychol Rehabil 2020;:1-14. doi:10.1080/09602011.2020.1760893.
20. Choi-Kwon S, Kim JS. Poststroke fatigue: An emerging, critical issue in stroke medicine. Int J Stroke 2011;6:328-36.
21. Ingles JL, Eskes GA, Phillips SJ. Fatigue after stroke. Arch Phys Med Rehabil 1999;80:173-8.