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A PROSPECTIVE STUDY ON POST STROKE DEPRESSION ASSESSMENT AND ITS IMPACT ON QUALITY OF LIFE IN STROKE PATIENTS

Rinu Mary Thomas[1], Bincy Ravi[1], Sam Jincy Das D. S.[1], Shahin S.[1], Silvia Navis[2*], Prasobh G. R.[3] and Shruthy B. Kurup[4]

[1]Fifth Pharm D Students, Sree Krishna College of Pharmacy and Research Centre, Parassala, Trivandrum, Kerala, India.

[2*]Professor and Head, Department of Pharmacology, Sree Krishna College of Pharmacy and Research Centre, Parassala, Trivandrum, Kerala, India.

[3]Principal and HOD, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Trivandrum, Kerala, India.

[4]Assistant Professor, Department of Pharmacy Practice, Sree Krishna College of Pharmacy and Research Centre, Parassala, Trivandrum, Kerala, India.

***Corresponding Author: Prof. Silvia Navis**
Professor and Head, Department of Pharmacology, Sree Krishna College of Pharmacy and Research Centre, Parassala, Trivandrum, Kerala, India.

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ABSTRACT

Background: Stroke is important neurological problem and is the third leading cause of disability adjusted life years (DALYs) worldwide. Depression is a mental health disorder consisting of two or more episodes of depressed mood, loss of interest, diminished sense of pleasure causing significant impairment in daily life. Post stroke depression (PSD) is significantly associated with increased risk of disability, stroke recurrence and poor quality of life. We assessed the proportion of depression, functional status, prescribing pattern in post stroke depression and impact on quality of life in stroke patients. **Methods**: A total of 98 patients whom visited the Department of neurology at a tertiary care hospital who had stroke and depressive symptoms as their chief complaints were enrolled for the study. **Result**: A total of 88 stroke patients fulfilling the study criteria were included, after excluding 10 patients as per the exclusion criteria. The statistical analysis clearly depicts that 34% had post stroke depression & QoL with a $p \leq 0.001$ and functional status $p \leq 0.001$ is highly significant. **Conclusion**: The aim of the study was to determine the proportion of depression, functional status, prescribing pattern in post stroke depression and impact on quality of life in stroke patients. In our research, depressed stroke patients was having a low functional status as well as poor quality of life. However, a larger sample size and longer duration of study is required to produce valuable and reliable results

KEYWORDS: Post stroke depression, stroke, quality of life, functional status, antidepressants.

INTRODUCTION

Stroke is important neurological problem and is the third leading cause of disability adjusted life years (DALYs) worldwide khedr *et.al.*, 2020.[1] Depression is a mental health disorder consisting of two or more episodes of depressed mood, loss of interest, diminished sense of pleasure causing significant impairment in daily life Elisebetta *et.al.*, 2014.[2] Most studies show that about one-third of patients experience depression after stroke Shreya *et.al.*, 2018.[3] Post stroke depression (PSD) is often under diagnosed and under reported in part because cognitive problems after stroke can confound the symptoms of depression and make the diagnosis of depression difficult Khedt *et.al.*, 2020.[1] PSD is significantly associated with increased risk of disability, stroke recurrence and poor quality of life. PSD negatively influences functional outcomes after stroke, decreases quality of life and increases mortality Jong *et.al.*, 2016.[4] In India the prevalence of PSD was found to be 55% according to the study conducted by Patra et.al., 2021[5] and in kerala the prevalence was found to be 42% in the study conducted by Vincent et.al., 2020.[6]

MATERIALS AND METHODS

In this study, a total of 98 patients whom visited the Department of neurology at a tertiary care hospital who had stroke and depressive symptoms as their chief complaints were enrolled for the study. Out of the 98 patients, 10 of them were excluded, in accordance with the exclusion criteria. The remaining 88 patients were enrolled for the study. The impact on the quality of life, proportion of depression in stroke patients, Prescribing pattern and their functional status was assessed in the study.

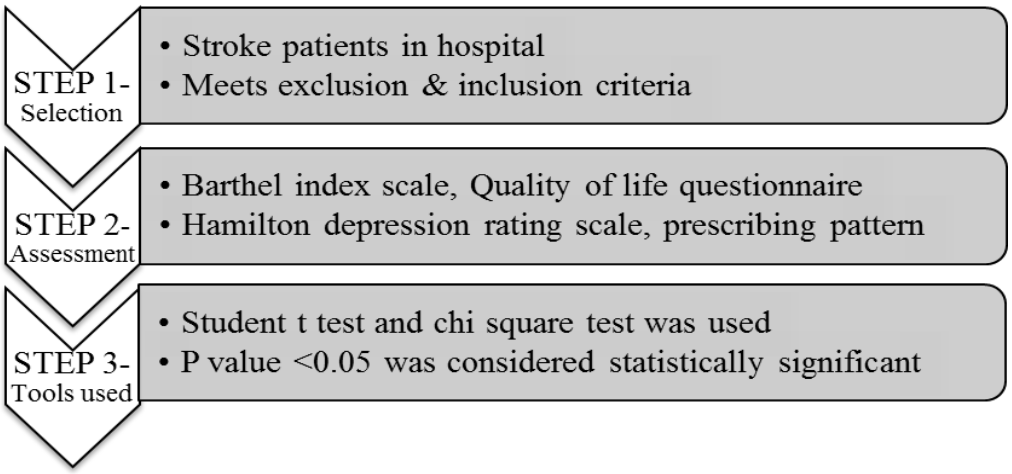

Figure 1: Research process.

➢ **INCLUSION CRITERIA**
- Patient diagnosed with stroke
- 18 years or old
- Alert and oriented persons

➢ **EXCLUSION CRITERIA**
- Unable to communicate because of disturbed consciousness
- Severe hearing or visual impairment patients

The study was conducted after getting the clearance from the Institutional Human Ethical committee. A written informed consent was taken from the patients as per ICMR Biomedical research guideline format.

Data was collected by using a suitably designed proforma. Depression scoring was done using HAM-D scale. Quality of life of stroke patients was assessed using Stroke Specific Quality of Life Questionnaire (SS-QoL) in which the parameters included was energy, family role, language, mobility, mood, personality, self-care, social role, thinking, upper extremity function, vision, work/productivity. Barthel index scale was used to assess the functional status in which the categories assessed was feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers (bed to chair and back), mobility and stairs. Prescribing pattern was obtained by referring to hospital case records. Informed consent was obtained and no additional charges was levied from the participants. At the end of study all the parameters and scores were compared from baseline to end of study.

STATISTICAL ANALYSIS

Qualitative variables are expressed using frequency and percentage. The sample population was divided into depressed and non-depressed stroke patients as well as male and female stroke patients. Data analysis was done by using Student t-test for the comparison between two groups and Chi square test to find the significance of study parameters on categorical variables. A p value of < 0.05 was considered to be statistically significant. Data analysis was performed using Prism graph-pad.

RESULT

Table 1: Demographic and socioeconomic data of PSD.

Characteristics of patients	Non-depressed stroke patients, N= 58	Post stroke depressed patients, N= 30	P value
SEX			
Male	40	16	0.3185
Female	18	14	
AGE			
≤50	5	1	0.2655
51-60	21	3	
61-70	24	12	
≥70	8	14	
OCCUPATION			
Employed	31	11	0.0887
Unemployed	27	19	
MARITAL STATUS			
Single	0	0	0.7098
Married	58	30	

P value- > 0.05, ns

As per the demographic and socioeconomic data of our study, post stroke depressed patients was found more to be in males, than in females. It may be because in Asian families, since males are the head of the family, their disability due to stroke results in a psychological impact more than that of females.

In our study, even though more number of post stroke depressed patients can be seen in elderly patients, above 60years of age, there is no significant association between age and PSD, which is in line with previous studies. Also the unemployment and marital status of post stroke depressed patients were more than non-depressed stroke patients in our study, but there was no statistical significance, which is similar to the study of Khedr *et.al.*, 2020 in which he demonstrated that marital and job status were not significantly different between depressed and non- depressed stroke patients.[1]

Table 2: Co-morbid medical illness of PSD patients.

Co-morbidities	Non-depressed stroke patients, N= 58	Post stroke depressed patients, N= 30	P-value
HYPERTENSION			
Yes	36	27	0.4197
No	22	3	
HEART DISEASE			
Yes	10	4	0.5889
No	48	26	
DIABETES			
Yes	36	16	0.1863
No	22	14	
THYROID DISEASE			
Yes	6	4	0.6380
No	52	26	
OTHERS			
Yes	16	13	0.3986
No	42	17	

P value- > 0.05, ns

In our study, the most common co-morbidity seen was hypertension both in depressed stroke patients (27 patients) and non-depressed stroke patients (36 patients), followed by diabetes which was seen in 16 depressed stroke patients and 36 non-depressed stroke patients. There is no significant association between co-morbidities (hypertension, heart disease, diabetes, thyroid disease) and PSD, which is in accordance with the study conducted by Khedr *et.al.*, 2020.[1]

Table 3: Assistance required for taking medicines in PSD patients.

Assistance required for taking medicines	Non-depressed stroke patients, N= 58	Post stroke depressed patients, N= 30	P-value
Yes	**16**	**21**	**0.002**
No	**42**	**9**	

P value - < 0.01 **

The help required in taking medicines was compared between depressed stroke patients and non-depressed stroke patients, which suggests that greater number of post-stroke depressed patients required assistance in taking medicines, whereas lesser number of non-depressed stroke patients required assistance in taking medicines. This indicates that declining self-efficacy was associated with increased depressiveness. Thus there is a significant association between self-efficacy and post stroke depression.

Table 4: Dependency for the activity of daily living of PSD patients.

Dependent for activity of daily living	Non-depressed stroke patients, N= 58	Post stroke depressed patients, N= 30	P-value
Yes	**17**	**22**	**<0.001**
No	**41**	**8**	

P value- 0.001, ***

There is a highly significant association between the dependency for the activity of daily living and PSD. In our study, the dependency for the activity of daily living is more in post stroke depressed patients than in non-depressed stroke patients. This in turn indicates that the dependency for the activity of daily living is seen more in depressed stroke patients which is in accordance with previous studies.

Table 5: Functional status of PSD patients.

Functional status	Non-depressed stroke patients, N=58	Post stroke depressed patients, N=30	P-value
Total dependency	1	3	<0.001
Severe dependency	10	19	
Moderate dependency	31	8	
Slight dependency	10	0	
Independent	6	0	

P value- 0.001, *

In this study, there is highly significant association between Functional Impairment and PSD. In the current study, PSD was more common in those with more severe and total post-stroke functional impairment, i.e. functional impairment was seen increased in depressed stroke patients, than in non-depressed stroke patients in terms of total dependency and severe dependency, measured by barthel index scale which is in line with study of Schottke *et.al.*, 2020.[7] Thus the burden of functional impairment increases the risk of PSD and thereby also affects the quality of life. Similarly, study by Khedr *et.al.*, 2020 has also demonstrated the significant relationship between functional impairment and post stroke depression.[1]

Table 6: Quality of life of PSD patients.

Quality of life	Non-depressed stroke patients, N= 58	Post stroke depressed patients, N=30	P-value
Good	25	2	<0.001
Average	30	8	
Poor	3	20	

P value- 0.001, *

There is high significant association between the Quality of life and post stroke depression. The patient's quality of life was measured using validated questionnaire, in which poor quality of life was seen increased in depressed stroke patients than in non-depressed stroke patients. Similar to our study, Khedr *et.al.*, 2020 reported that the quality of life assessed, was significantly poor among stroke patients with depression than in stroke patients without depression.

Table 7: Gender wise distribution of Risk factors and complications in stroke patients.

Risk factors & complications	Male stroke patients, N= 55	Female stroke patients, N=33	P value
Hypertension			
Yes	40	23	0.5167
No	15	10	
Depression			
Yes	16	14	0.4486
No	39	19	
Diabetes			
Yes	33	19	0.2102
No	22	14	
Heart disease			
Yes	11	3	0.6573
No	44	30	

P value >0.05, ns

In the gender wise distribution of risk factors and complications in stroke patients in our study, Hypertension, depression, diabetes and heart disease was found to be occurring more commonly in male stroke patients than female stroke patients. However, it is not statistically significant.

Table 8: Age wise assessment of co-morbidities in stroke patients.

Age wise distribution	Co-morbidities present	Co-morbidities absent	P value
<50 years	4	2	<0.001 ***
51-70 years	60	0	
>70 years	21	1	

P value, <0.001 *

There is highly significant association in the age wise distribution of co-morbidities in stroke patients. Considering the age wise distribution, 4% of the stroke patients of age <50 years, 71% of the stroke patients of age between 51-70 years and 25% of stroke patients above 70 years of age had one or more co-morbidities. Stroke patients with one or more co-morbidities is more in number than stroke patients without co-morbidities.

Table 9: Proportion of depressed stroke patients.

Depression	Frequency	Percentage
Severe	9	10.2
Moderate	21	23.8
Normal	58	65.9

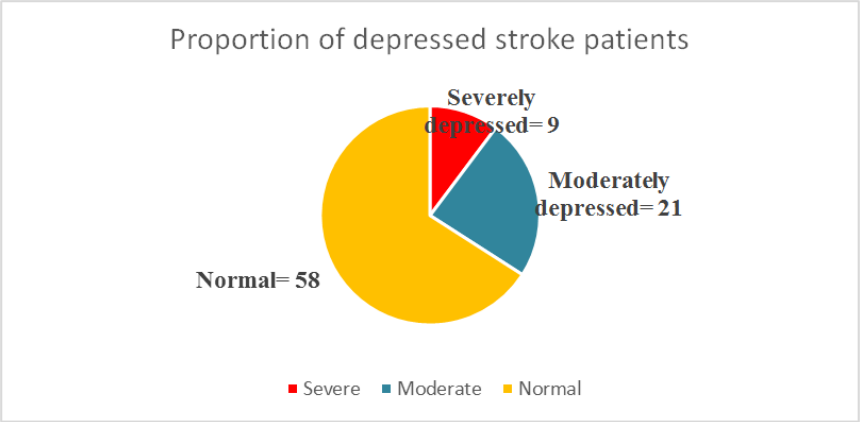

Figure 2: Proportion of depressed stroke patients.

The proportion of post stroke depression was assessed using Hamilton depression scale, from which we can conclude that 65.9% of the patients are not having depression, where as 23.8% of the stroke patients are having moderate depression and 10.2% of the stroke patients are having severe depression. Thus, 34% of the stroke patients were having depression in our study, which is in agreement with the previous studies.

Table 10: Proportion of patient receiving antidepressants.

Antidepressant	Frequency	Percent
No	70	79.5
Yes	18	20.5
Total	88	100

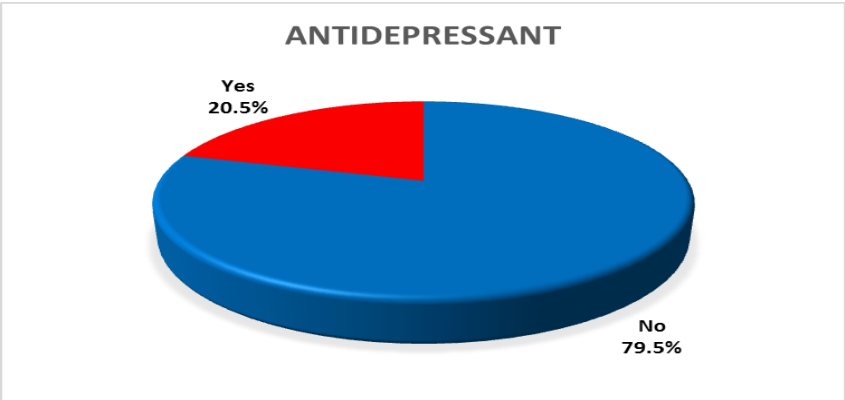

Figure 3: Proportion of patients receiving antidepressants.

In our study, 20.5% of the stroke patients were receiving antidepressants. The most commonly prescribed drug for post stroke depression was Escitalopram, (T. Nexito), a selective serotonin re-uptake inhibitor (SSRIs).

DISCUSSION

The primary purpose of the study was to assess the occurrence of depression in post-stroke patients, as well as their functional status and quality of life. This study included a total of 98 participants, with 10 patients being excluded due to exclusion criteria. There was 58 non-depressed stroke patients and 30 post-stroke depressed patients. None of these patients had taken antidepressant medication before stroke.

In this study, 34% of stroke patients were suffering from post-stroke depression, our study is matching with the study conducted by priya et.al., 2017 in which 32.5% were suffering from PSD.[8] Also the study conducted by paolucci et.al., 2019 was having 32.25% of post-stroke depressive patients.[9] Contrary to these studies, some show a higher frequency of PSD; A study by Litton et.al., 2016 had a frequency of 47% of PSD patients.[10] These deviations in the frequency of PSD maybe because of the variation of age, financial challenges, dependency for activities of daily living and poor quality of life.

According to demographic and socioeconomic data, 16 male and 14 female patients were affected by post-stroke depression out of a total of 88 patients. Similar to our findings, in the study of Kulkantrakorn and Jirapramukpitak., 2007, male PSD had unfavourable prognosis, as in Asian families, since males are the head of the family, their disability due to stroke results in a psychological impact more than that of females.[11] The study by Litton *et.al*., 2017 found the severity of depression in male patients to be a slightly higher. One of the reason could be the dependency in activities of daily living due to stroke, which is of greater importance for males psychologically, as compared to females. Another reason may be the less coping abilities of males as compared to females. The study by Priya *et.al.*, 2017 also shows that male stroke patients were more depressed.

In terms of age distribution, only one patient under the age of 50, three patients between the ages of 51 and 60, twelve patients between the ages of 61 and 70, and fourteen patients above the age of 70 were affected. There is no significant association between age and PSD, which is in accordance with the study of Zhang *et.al*., 2013.[12]

In terms of employment, 11 patients were employed and 19 patients were unemployed. Similarly in the study of Oni *et.al*., 2018 findings suggest that stroke survivors with depression were more prone to financial challenges because of unemployment, increased health care bills and virtual lack of insurance coverage.[13]

According to marital status, all of the patients are married and 30 of them are having PSD. In a study by Ibeneme *et.al*., 2016 shows there is a likely relative but not significant influence of age, living with spouse and type of employment in stroke survivors.[14]

In this study, the most common comorbidity seen in patients was hypertension. Twenty-seven of the thirty PSD patients had hypertension, which is also frequent in non-depressed stroke patients. Diabetes was the next most prevalent comorbidity, affecting 16 patients, while thyroid and heart illnesses were the third most common diseases. The study of Ashok *et.al*., 2020 also found that majority of individual had diabetes and hypertension as a comorbid condition.[15] Our study also indicate that the most leading comorbidity is hypertension followed by diabetes.

In this study, 21 of the 30 PSD patients required assistance in taking their medications, while 16 of the non-depressed patients need assistance in taking their medications. This indicates that declining self-efficacy was associated with increased depressiveness. Thus there is highly significant association between self-efficacy and post stroke depression which is similar to the study of Matthias *et.al*., 2016.[16]

In case of reliance, 22 PSD patients were reliant on others for activities of daily living, while 17 non-PSD patients were reliant. The study of Umaru *et.al.*, 2013 demonstrated that post stroke depression alone was significantly negatively related to functional recovery in ADL.[17] The study by Lai *et.al.*, 2002 also reported that depressed stroke patients were less likely to achieve ADL than non-depressed stroke patients, which in turn indicate that the dependency for the activity of daily living is seen more in depressed stroke patients.[18]

For measuring the functional status of the non-depressed stroke patients and post-stroke depressed patients, the categories assessed in the Barthel index scale was feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers (bed to chair and back), mobility and stairs. Based on functional status, in the case of PSD patients, 3 had total dependency, 19 had severe dependency, and 8 had moderate dependency. Tamara *et.al.*, 2014 describes that functional disability was significantly more severe in depressed patients compared with non- depressed patients, with a highly significant difference in ambulation.[19]

Quality of life (QoL) is the degree to which an individual is healthy, comfortable and able to participate in or enjoy life events, which is highly specific. The parameters which was included to measure the QoL were energy, family role, language, mobility, mood, personality, self-care, social role, thinking, upper extremity function, vision, work /productivity. In this study, 20 PSD patients had a poor quality of life, eight had an average quality of life, and only two had a good quality of life. Stroke

patients who were not depressed, on the other hand, have a higher quality of life. In the study of Khedr *et.al.,* 2020 the quality of life assessed was significantly poor among stroke patients with depression than in stroke patients without depression. The study of Kim *et.al.,* 2018 also indicate that PSD is associated with low QOL in the acute phase of stroke is consistent with previous findings that post-stroke depressive symptoms are associated with poor stroke QOL.[20] Szymon *et.al.,* 2020 showed that after a month of stroke, most of the quality of life domains were reduced and that functional disability and depression were independent predictors of QOL.[21] Wahyudi *et.al.,* 2020 also showed that depression had a significant negative effect on the quality of life of stroke patients, therefore major depression reduced the quality of life of stroke patients.[22]

According to the gender-specific distribution of risk factors and complications in stroke patients, a total of 33 female stroke patients and 55 male stroke patients were studied, in which 23 female and 40 male patients was suffering from hypertension. The next most prevalent condition is diabetes that affected 33 male and 19 female stroke patients, followed by depression, which affected 14 female and 16 male patients.

According to the age-wise distribution of comorbidities, conditions are more common between the ages of 51 and 70, and after the age of 70. Stroke patients with one or more co morbidities is more in number than stroke patients without comorbidities which is in line with the study conducted by Mohammad *et.al.,* 2019.[23]

In this study, 10.2 percent of stroke patients were severely depressed, and 23.8 percent of them suffer from moderate depression, while the others are normal. Thus 34%, of the stroke patients were having depression in this study, which is in agreement with the study conducted by Paolucci *et.al.,* 2019 as well as previous studies. The study conducted by Bour *et.al.,* 2010 out of 190 patients, 30 were suffering from major depression and 20 patients suffering from minor depression which shows that statistical difference is less.[24]

Antidepressants were prescribed to 20.5% of the PSD patients in our study. From our study, we found that Escitalopram, an SSRI was the most popular treatment offered to post-stroke depressed patients. A study by Salter *et.al.,* 2013 performed a meta-analysis which summarized that the PSD and development of PSD was reduced with the use of SSRI.[25]

CONCLUSION

The present study demonstrated the assessment of depression and its impact on the quality of life in stroke patients. The aim of the study was to determine the proportion, functional status, prescribing pattern in post stroke depression and impact of quality life in stroke patients. From this study we can conclude from results that the proportion of people with post-stroke depression was 10.2% having extreme, 23.8% moderate and 66% having no depression. Escitalopram, SSRIs were the most popular treatments offered to depressive stroke patients. Patient counselling and mental support was used to treat mild depression. In this study, stroke patients with a low Barthel index score had a higher degree of depression, as well as a lower quality of life. However larger number of samples and longer duration of study are required to produce valuable and reliable results.

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