

A Study to Find Out Correlation of Depression with The Level of Disability in Stroke Patients

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ABSTRACT

BACKGROUND: Stroke is a medical emergency, and can cause permanent neurological damage, complications, and even death. Depressive disorders and diminished functional capabilities have been recognized as common consequences of stroke. More than one half of all stroke survivors are left with disabilities that prevent them from returning to their prestroke level of health and productivity. Poststroke depression is considered as the most frequent and important neuropsychiatric consequence of stroke. As both depressive disorders and disability occurs after stroke, the purpose of the study is to correlate and find the relationship of depression with the level of disability in stroke patients.

METHOD: A total of 100 stroke patients of both sexes in the age group of 30 to 60 years within a given time duration of 6 months after stroke were assessed for their depression and disability level. Depression was measured using Hamilton Depression Rating Scale (HDRS) with scores ranging from 0 to 54 and Disability was measured using modified Rankin Scale (mRS) with scores ranging from 0 to 6.

OUTCOME MEASURE:

The following outcome measures were measured:

1. Depression was measured using Hamilton Depression Rating Scale (HDRS)
2. Disability was measured using modified Rankin Scale (mRS)

STATISTICAL ANALYSIS:

- Karl Pearson's correlation
- P value <0.05 is taken up for statistical significance

RESULTS: The r- value is 0.836, p- value is 0.000 and the result is highly significant with p<0.05 significance. In this study, r is between -1 and 1. Since it is a positive value (0.836), we can conclude that there exists a significant positive correlation between depression (HDRS) and level of disability (mRS) in stroke patients.

CONCLUSION: Depression had a strong positive correlation with Disability in stroke patients.

Keywords: Stroke, Depression, Disability, Hamilton Depression Rating Scale (HDRS), Modified Rankin Scale (mRS).

INTRODUCTION

Stroke, known medically as a cerebrovascular accident (CVA), is the rapidly developing loss of brain function(s) due to disturbance in the blood supply to the brain.¹ Surveys suggest that the prevalence of stroke in India is about 0.5%, with an annual mortality of over 1,00,000 that represents 1.2% of all deaths.² In spite of

enormous advances in the understanding and treatment of stroke, prevention remains the strategy of paramount importance.³ Stroke can be due to ischemia (lack of blood flow) caused by blockage (thrombosis, arterial embolism), or a hemorrhage (leakage of blood)¹. As a result, the affected area of the brain is unable to function, leading to inability to move one or more limbs on one side of the body, inability to understand or formulate speech, or an inability to see one side of the visual field.⁴ The main risk factors for stroke are common to other Non-Communicable Diseases (NCDs) and most are modifiable with effective interventions. These include high blood pressure, smoking, high blood sugar, lack of exercise, being overweight and obesity.⁵ Ischemic strokes are those that are caused by interruption of the blood supply, while hemorrhagic strokes are the ones which result from rupture of a blood vessel or an abnormal vascular structure.

Clinically, a variety of focal deficits are possible including changes in the level of consciousness and impairments of sensory, motor, cognitive, perceptual and language functions. To be classified as stroke, neurological deficits must persist for at least 24 hours.⁶ Common residual effects of stroke include paralysis of the face, arms and legs; impairment of thought processes: speech and language problems; and visual disturbances. In addition to affecting physical functioning, self-care and the ability to live independently, stroke can cause anxiety and emotional distress in most stroke patients.

Some of the physical disabilities that can result from stroke include muscle weakness, numbness, pressure sores, pneumonia, incontinence, apraxia (inability to perform learned movements), difficulties carrying out daily activities, appetite loss, speech loss, vision loss, and pain. If the stroke is severe enough, or in a certain location such as parts of the brainstem, coma or death can result.

Emotional problems resulting from stroke can result from direct damage to emotional

centers in the brain or from frustration and difficulty adapting to new limitations. Post-stroke emotional difficulties include anxiety, panic attacks, flat affect (failure to express emotions), mania, apathy, and psychosis. 30 to 50% of stroke survivors suffer poststroke depression. Depression can reduce motivation and worsen outcome; but can be treated with antidepressants.

Cognitive deficits resulting from stroke include perceptual disorders, speech problems, dementia, and problems with attention and memory.

Stroke is a medical emergency, and can cause permanent neurological damage, complications, and even death. Stroke is a major public health problem. Traditionally, epidemiological stroke studies have focused on mortality and recurrence^{7,8} and not on the long term morbidity. The progressive decrease in stroke mortality observed in the last few decades, and the subsequent increase of survivors with residual impairments and disabilities, have been accompanied by a growing interest in the factors that could interfere with functional outcome and quality of life.⁹

Within the first 30 days following stroke, the mortality rate is high (30%).¹⁰ 87% of strokes are caused by ischemia, and the remainder by hemorrhage.⁴ The mortality rate is more severe for hemorrhagic stroke than for ischemic stroke.¹¹ However more than 50% of stroke survivors are alive in 5 years.¹² Given this good survival rate and the continuing high incidence of stroke, estimating and understanding disability following stroke becomes a high priority in health care.

Although the incidence of stroke is decreasing, its prevalence in the population appears to be increasing because of enhanced stroke survival and a growing elderly population. The prevalence of stroke survival is currently over 2,000,000. Stroke ranks as the leading cause of disability in adults. More than one half of all stroke survivors are left with disabilities that prevent them from returning to their prestroke level of health and productivity.¹³

The prevalence of disability among stroke survivors is between 24- 54%.¹⁴

Disability is defined as “a physical or mental impairment that substantially limits one or more major life activities. An individual may also qualify as disabled if he/ she has had an impairment in the past or is seen as disabled based on a personal or group standard or norm. Such impairments may include physical, sensory, and cognitive or intellectual impairments.¹⁵

Patients born with a physical disability and those who acquire them as a result of accident or disease later in life have substantial psychological differences. Children born with a physical disability have only experienced life with their impairment; the development of their self-identity commonly mirrors that of children without disabilities. In contrast, patients with adventitious disabilities often experience acute loss and grief. Patients with gradually progressive diseases or disabilities of sudden onset often experience anxiety and shock when first becoming aware of their condition. Such anxiety and shock is followed by anger and depression, as patients realize the magnitude and consequences of their diagnosis.¹⁶ Disabilities of sudden onset (eg. Injuries or accidents) are usually experienced as crises that will change the lives.

Adjustment to disability is never easy, and there is no standard approach that patients take to that end. There is a real question as to whether anybody with a major neurological disability ever really “accepts” the disability. The coping process really never ends.¹⁷

Depressive symptoms are frequent after stroke. Their time course varies and depends on the cognitive status, this variation contributes to differences among previous studies on post stroke depression.¹⁸

Depression can strike anyone but people with serious illnesses such as stroke may be at greater risk. Appropriate diagnosis and treatment of depression may bring substantial benefits to persons recovering from a stroke by improving their medical

status, enhancing their quality of life, and reducing their quality of life, and reducing their pain and disability. Treatment for depression also can shorten the rehabilitation process, lead to more rapid recovery and resumption of routine, and some health care costs.

Depression may be described as feeling sad, blue, unhappy, miserable, or down in the dumps. True clinical depression is a mood disorder in which feelings of sadness, loss, anger or frustration interfere with everyday life for an extended period of time. Depression is generally ranked in terms of severity- mild, moderate or severe. Symptoms of depression include trouble sleeping or excessive sleeping, a dramatic change in appetite, often with weight gain or loss, fatigue and lack of energy, feeling of worthlessness, self- hate, and inappropriate guilt, extreme difficulty concentrating, agitation, restlessness, and irritability, inactivity and withdrawal from usual activities, feelings of hopelessness and helplessness, recurring thoughts of death or suicide. The main types of depression include major depression, atypical depression and dysthymia¹⁹. Etiological factors include genetic predisposition, neurophysiological factors, biochemical factors, psychological and interpersonal factors, severe stress and sociocultural factors.²⁰

Neurological illness may lead to frank depression without cognitive or behavioral deficits.²¹ This may be reactive or secondary to brain disease. Symptoms of depressive illness are apparent in three areas: affective regulation, somatic concerns and cognition.²²

Depression is considered as the strongest predictor of poor quality of life among stroke survivors.²³ Poststroke depression (PSD) occurs in approximately one- third of all ischemic stroke survivors and has been linked to worse functional outcome, slower recovery and worse quality of life. PSD is considered as the most frequent and important neuro- psychiatric consequence of stroke. The Diagnostic and Statistical

Manual (DSM) IV categorizes post-stroke depression as “mood disorder due to a general medical condition (i.e. stroke)” with the specifiers of depressive features, major-depressive like episodes, manic features, or mixed features.²⁴

PSD was not related to stroke lesion-related parameters like age, type and side of lesion, and post-stroke duration. This is in concordance with the majority of earlier studies.^{25,26,27} However, one study each had reported site of the lesion²⁸, younger age,²⁵ and older age²⁹ as being among the important risk factors for PSD. Although, post-stroke duration was not significantly correlated to PSD in our study, when yearly prevalence was calculated, there was significant reduction in the prevalence of PSD after 2 years. This is because longer post-stroke duration does have a positive effect on emotional responses to disability.³⁰ PSD is highly prevalent in both sexes, but appears to be slightly more common among women than men. Untreated depression after stroke can lead to reduced quality of life, poorer prognosis and increased mortality. All stroke patients should be routinely screened for depression, and further research is needed to determine whether there are sex-specific differences in response to treatment.³¹

MATERIALS & METHODS

MATERIALS USED

- Paper
- Pencil

METHOD OF COLLECTION OF DATA

Sampling technique: Cluster sampling technique.

Here we considered cluster as hospitals and randomly selected 100 stroke patients.

Method: A minimum of 100 patients in the age group of 30- 60 years following single

stroke given a history of 6 months after stroke were selected.

Patients were assessed and checked for depression using Hamilton Depression Rating Scale and then for disability using Modified Rankin Disability Scale.

Outcome Measures

Depression is measured using Hamilton Depression Rating Scale.

Disability is measured using Modified Rankin Disability Scale.

Method of administering Hamilton Depression Rating Scale

The Hamilton Depression Scale (HDS) is a test measuring the severity of depressive symptoms in individuals, often those who have already been diagnosed as having a depressive disorder. It is sometimes known as the Hamilton Rating Scale for Depression (HRSD) or the Hamilton Depression Rating Scale (HDRS). Scores of the scale can range from 0 to 54 with scores between 0 and 6 indicating a normal person with regard to depression, scores between 7 and 17 indicating mild depression, scores between 18 and 24 indicating moderate depression and scores over 24 indicating severe depression.

Method of administering Modified Rankin Scale:

The modified Rankin Scale (mRS) is a commonly used scale for measuring the degree of disability or dependence in the daily activities of people who have suffered a stroke. Scores of the scale can range from 0 to 6 with score 0 indicating no symptoms, score 1 indicating no significant disability, score 2 indicating slight disability, score 3 indicating moderate disability, score 4 indicate moderately severe disability and score 6 indicating severe disability.

Figure1: Administering Hamilton Depression Rating Scale and Modified Rankin Scale in Stroke patients



STATISTICAL ANALYSIS

Statistical analysis was done by using Karl Pearson’s correlation (r- value) to predict the score of Depression (Hamilton Depression Rating Scale) with level of Disability (Modified Rankin Scale) in stroke patients.

P value< 0.05 was taken as the level of statistical significance.

Statistical software: SPSS was used for data and Microsoft Word and excel to generate graphs and tables.

RESULT

A total of 100 stroke patients of both sexes in the age group of 30 to 60 years within a given time duration of 6 months after stroke were assessed for their depression and disability level.

TABLE 1: Mean, SD of age, depression, disability in the study group

	Mean	SD
AGE	44.60	7.92
DEPRESSION	23.99	6.95
DISABILITY	3.60	1.00

Table 1: It shows that mean value and SD of age of stroke patients were 44.6 and 7.92 respectively and of depression (HDRS) in stroke patients were 23.99 and 6.95 respectively and finally that of disability (mRS) in stroke patients were 3.60 and 1.00 respectively.

Table 2: Age Distribution Table

AGE	FREQUENCY
30 – 40	33
40 – 50	36
50 – 60	30
60 – 70	1
TOTAL	100

Table 2: It shows that in a study of 100 stroke patients, frequency of patients in the age group of 30 to 40 years is 33 respectively, 40 to 50 years is 36 respectively, 50 to 60 years is 30 respectively and 60 to 70 years is 1 respectively.

Table 3: Gender Distribution Table Frequency(f) and frequency%(f%) of female and male patients from total of 100 stroke patients.

GENDER	F	f%
Female	53	53.0
Male	47	47.0
Total	100	100.0

Table 3: It shows that in a study of total 100 number of stroke patients, it was found that frequency and frequency % of female stroke

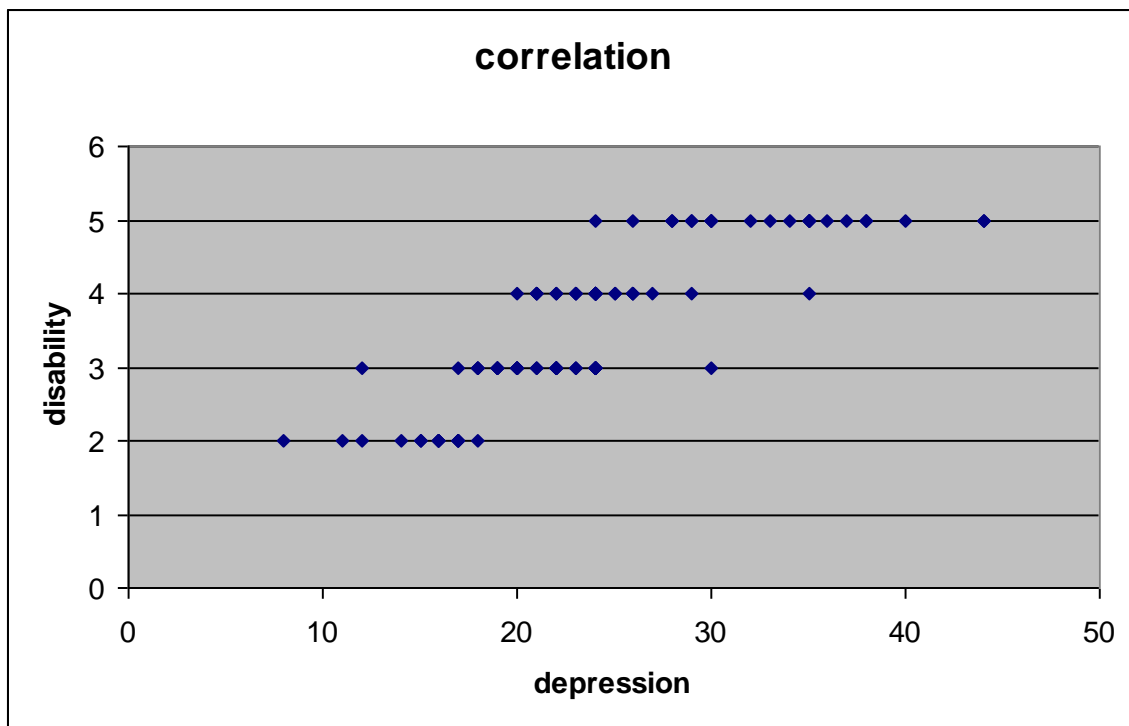
patients were 53 and 53 % respectively and that of male stroke patients were 47 and 47.0% respectively.

TABLE 4 and GRAPH 1:

Table 4: Correlation between depression and disability

r- value	p- value	Result
0.836	0.000	P<0.05 sig

Graph 1:



In the graph if points show upward trend, it is an indication of positive correlation.

increases. (When disability increases, depression also increases)

Table 4 and graph 1:

Here it shows that the r- value is 0.836, p-value is 0.000 and the result is highly significant with p<0.05 significance.

We say that there exists correlation between two values if r value lies between -1 and 1 and correlation is said to be significant if p-value<0.05. In this study, r is between -1 and 1. Since it is a positive value (0.836) we can conclude that there exists a significant positive correlation between depression (HDRS) and level of disability (mRS) in stroke patients. This means when one variable increases, another variable also

DISCUSSION

Depressive disorders and diminished functional capabilities have been recognized as common consequences of stroke. So, we have tried to find out the relationship between depression and level of disability in stroke patients for which a minimum of 100 stroke patients (both males and females) in the age group of 30 to 60 years within a given time duration of 6 months after stroke were assessed and their depression and disability scores were noted and correlated. Depression was assessed using Hamilton Depression Rating Scale (HDRS) and

Disability was assessed using modified Rankin Scale (mRS).

In this study, Depression was measured using Hamilton Depression Rating Scale (HDRS) with scores ranging from 0 to 54 and Disability by Modified Rankin Scale (mRS) with scores ranging from 0 to 6. By statistical analysis, it was found that mean, SD of age was 44.6 and 7.92 respectively and of depression were 23.99 and 6.95 respectively and of disability were 3.60 and 1.00 respectively. It was found that r value is 0.83, p value is 0.00 and the result is highly significant with $p < 0.05$ significance. Thus, we have found a strong correlation between depression and level of disability in stroke patients.

One of the studies done by Maree L Hackett and Chaturangi Yapa reported that depression is common stroke patients with the risks of occurrence being similar for the early, medium and late stages of recovery.³² Other study done by Coffee C. Edward and Cummings Jeffrey L reported that disability affects 75% of stroke survivors enough to decrease their employability.³³

Previous investigators have demonstrated that poststroke depression during the acute phase of recovery adversely affects functional abilities³⁴⁻³⁶, short-term physical therapy outcome³⁵, and long term functional recovery^{37,38}. Lenze EJ, Rogers JC et al conducted many studies and have demonstrated that depressive symptoms are related to disability and poorer recovery from medical incidents independent of the increased medical burden experienced by depressed adults.³⁹

As both depressive disorders and disability occurs after stroke, we have tried to find the relationship between depression and disability level in stroke patients and could find that there exists a positive correlation between depression and disability level in stroke patients which means that as disability increases in stroke patients, their depression level also increases. Thus, proving the study is highly significant.

Thus, this study finds the relationship between depression and disability level in

stroke patients. These scales also help in predicting the patient's affected with depression and disability and the existence of their influence on each other after stroke.

Limitations:

Very narrow section of the population within a very specific geographical area was taken for study.

Short duration study.

Clear cause for the correlation between depression and disability could not be found.

CONCLUSION

- Our hypothesis that there would be a significant relationship between depression (HDRS) and level of disability (mRS) in stroke patients is accepted.
- We found that there is a high strong positive correlation between depression (HDRS) and disability (mRS) in stroke patients.

Declaration by Authors

Ethical Approval: Approved

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Conflict of Interest: The authors declare no conflict of interest.

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