

# Burden of Depression Among Survivors of Ischemic Stroke of Southern Punjab

DR. MUHAMMAD ASIF, MBBS, FCPS,  
Senior Registrar, Ibne Siena Hospital, Multan, Pakistan

DR. NOMAN AMJAD, MBBS  
Postgraduate Registrar (Psychiatry),  
Department of Psychiatry, Nishtar Hospital Multan, Pakistan

DR. OWAIS KAREEM, MBBS, FCPS  
Assistant Professor (Psychiatry),  
Department of Psychiatry, Nishtar Hospital Multan, Pakistan

DR. SOHAIB HASSAN, MBBS, FCPS  
Senior Registrar,  
Department of Neurology, Nishtar Hospital Multan, Pakistan

DR. QURAT-UL-AIN FATIMA, BDS, M. Phil  
Assistant Professor (Behavioral Sciences),  
Multan Medical and Dental College, Multan, Pakistan

DR. FAZAL-UL-REHMAN, MBBS  
Postgraduate Registrar (Psychiatry),  
Department of Psychiatry, Benazir Bhutto Hospital Rawalpindi, Pakistan

## Abstract

**Background;** Depression is one of the most frequent neuropsychiatric disturbances after ischemic stroke. The frequency of depression in stroke patients has varied widely in different populations. Post stroke depression is an important factor limiting recovery and rehabilitation in acute stroke patients. This study was done to ascertain frequency of depression among patients with ischemic stroke in our local population.

**Objective;** To assess the frequency of depression in patients with ischemic stroke in Pakistan.

**Material and Methods;** Consecutive 150 patients fulfilling inclusion criteria was enrolled and this descriptive study was conducted at department of Psychiatry and Neurology OPD, Nishtar Hospital, Multan using non – probability convenient sampling technique. All patients were assessed by single psychiatrist on PHQ-9 scale, for Depression.

**Results;** Of these 150 study cases, 94 (62.7 %) were male patients while 56 (37.3 %) were female patients. Mean age of our study cases was  $54.69 \pm 7.18$  years (with minimum age of our study cases was 44 years while maximum age was 71 years). Of these 150 study cases, 71 (47.3 %) belonged to rural areas and 79 (52.7 %) belonged to urban areas. Monthly family income up to Rs. 50000 was noted in 89 (59.3%) while more than Rs. 50000 was noted in 61 (40.7%). Of these 150 study cases, 83 (55.3%) were illiterate and 67 (44.7%) were literate. Of these 150 study cases, site of lesion in basal ganglia was 61 (40.7%), subcortical in 56 (37.3%) and cortical in 33 (22.0%) and Depression was noted in 77 (51.3%).

**Conclusion;** Very high frequency of depression was observed in our study among patients having ischemic stroke. Depression was significantly associated with gender, occupation, educational level, prolonged duration of illness and site of lesion. Clinicians treating stroke patients should anticipate depressive symptoms and diagnose them to treat them in early stages.

**Keywords;** Ischemic stroke, depression, frequency.

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## INTRODUCTION

Depression is a mental health disorder wherein low mood and low energy can affect a person's thoughts, feelings, behaviour and sense of well-being. It is characterized by disturbed sleeping pattern, change in appetite, fatigue, irritability, reduced ability to concentrate, difficulty in decision making and even suicidal thoughts. Depression is a common psychological state affecting over 350 million people from all age groups<sup>1</sup>. Unipolar depressive disorder is expected to be the most significant cause of disease burden by the year 2030<sup>2</sup>. Similarly stroke is a common neurological problem and the third leading cause of death in developed countries of the world<sup>3</sup>. Among

survivors, over 50% have significant disabilities creating physical, social and psychological burden on themselves as well as on the family<sup>4</sup>. Among Asian countries, Pakistan shares a significant burden of this devastating disease contributing towards an exponential expenditure of resources, finances, community manpower, health services and the economy as a whole<sup>5</sup>. Evidence suggest that, in developing countries like Pakistan, stroke is the leading cause of death and disability<sup>6</sup>. In Pakistan, there was a crude age-and sex-adjusted stroke incidence of 95 per 100,000 persons per year for the years 2000 to 2016, with the highest incidence being 584,000 of 650,000, noted among individuals aged 75 to 85<sup>7</sup>. Neuropsychological symptoms are probably among the most commonly ignored complications in stroke patients. Depression is a common yet often unrecognized neuropsychological consequence of stroke, having biological, psycho behavioral and social dimensions<sup>8</sup>. Depression occurs in approximately one third of stroke survivors at any one time, is associated with poor functional outcomes<sup>10</sup> and higher mortality<sup>11</sup>. Depression and stroke combined have a far more detrimental effect on health than individually and are reported to decrease the quality of life. Depression impedes rehabilitation progress following stroke and is associated with impaired functional outcome, cognitive decline, and increased mortality.

The early diagnosis and successful intervention may improve clinical outcome of PSD and should be considered a key for better stroke care and management. Early effective treatment of depression may have a positive effect not only on depressive symptoms but also on the rehabilitation outcome of stroke patients, decreasing its rates of mortality, morbidity, and also decreasing the economic burden of the disease. Despite the increased prevalence of depression and stroke within Pakistan, few studies have been conducted to assess the relationship between the two comorbidities and mostly outdated as well. Knowing the increased prevalence of stroke in our country recent research is needed on the morbidity associated with it.

#### **MATERIALS AND METHODS:**

This descriptive study was conducted at department of Psychiatry, and Neurology OPD, Nishtar Hospital, Multan using non – probability convenient sampling technique. Duration of this study was 6 months from January 2020 to June 2020. The calculated sample size was 150 cases with  $d = 8\%$  margin of error, 95% confidence level and  $p=35\%$ <sup>4</sup>. Which was calculated by WHO calculator(1.1).

Patients with episode of ischemic stroke of either sex (aged 30 – 80 years) presenting in outpatient with a duration of 01-06 months after the event, confirmed by CT Scan which had ability to communicate verbally, having no speech difficulty were included in our study. Patients with past history of depressive illness, at risk of suicidal attempts, pregnant ladies, history of chronic liver disease, metabolic disorders, Hepatitis B & C and Tuberculosis, history of Myocardial infarction, Congestive heart failure, Hypothyroidism, Hyperthyroidism, Recurrent Stroke, Hemorrhagic stroke, history of drug addiction, altered sensorium and cognitive deficits were excluded from our study.

Prior permission was obtained from Institutional Ethical Committee. Informed consent was taken from each patient, describing them objectives and procedures of this study. They were informed that there is no risk involved to the patient while taking part in this study. All patients was assessed by single psychiatrist on PHQ-9 scale, for Depression. The patients were categorized having depression or not having depression on the PHQ-9 scale scoring.

Data was entered and analyzed with SPSS version 20. Quantitative variables like age of the patient, the duration of stroke was measured as a mean  $\pm$ SD, qualitative variables like gender, depression, site of stroke lesion, education level, occupational status, residential status were measured as frequency and percentage.

The effect modifiers like age, gender, literacy level, occupational status, monthly income and the site of stroke lesion were controlled by stratification. Post stratification chi-square test was applied,  $p$  value  $\leq 0.05$  was significant.

#### **RESULTS**

Our study comprised of a total of 150 patients meeting inclusion criteria of our study. Of these 150 study cases, 94 (62.7 %) were male patients while 56 (37.3 %) were female patients. Mean age of our study cases was  $54.69 \pm 7.18$  years (with minimum age of our study cases was 44 years while maximum age was 71 years). Mean age of the male patients was noted to be  $52.02 \pm 6.14$  years while that female patients was  $59.16 \pm 6.59$  years ( $p=0.000$ ). Our study results have indicated that majority of our study cases i.e. 100 (66.7 %) were aged more than 50 years. Of these 150 study cases, 71 (47.3 %) belonged to rural areas and 79 (52.7 %) belonged to urban areas. Monthly family income up to Rs. 50000 was noted in 89 (59.3%) while more than Rs. 50000 was noted in 61 (40.7%). Of these 150 study cases, 83 (55.3%) were illiterate and 67 (44.7%) were literate. Of these 150 study cases, 29 (19.3%) were laborers, 60 (40.0%) were farmers, 11 (7.3%) were office workers and 50 (33.3%) were house-wives. Mean duration of disease (stroke) was  $4.21 \pm 1.68$  months while 81 (54.0%) presented with more than 3 months duration. Of these 150 study cases, site of lesion in basal ganglia was 61 (40.7%), subcortical in 56 (37.3%) and cortical in 33 (22.0%). Depression was noted in 77 (51.3%) and it was stratified with regards to

gender, age, residential status, monthly family income, literacy, occupation, disease duration and site of lesion.

**Table No. 1**  
**Stratification of depression with regards to gender.**  
 (n = 150)

Gender	Depression		P – value
	Yes (n=77)	No (n=73)	
Male (n=94)	27	67	<b>0.000</b>
Female (n=56)	50	06	
<b>Total</b>	<b>150</b>		

**Table No. 2**  
**Stratification of Depression with regards to age.**  
 (n = 150)

Age	Depression		P – value
	Yes (n=77)	No (n=73)	
Up to 50 Years (n=50)	28	22	<b>0.489</b>
More than 50 Years (n=100)	49	51	
<b>Total</b>	<b>150</b>		

**Table No. 3**  
**Stratification of Depression with regards to residential status.**  
 (n = 150)

Residential status	Depression		P – value
	Yes (n=77)	No (n=73)	
Rural (n=71)	38	33	<b>0.627</b>
Urban (n=79)	39	40	
<b>Total</b>	<b>150</b>		

**Table No. 4**  
**Stratification of Depression with regards to monthly family income.**  
 (n = 150)

Family Income	Depression		P – value
	Yes (n=77)	No (n=73)	
Up to Rs. 50000 (n=89)	45	44	<b>0.869</b>
More than Rs. 50000 (n=61)	32	29	
<b>Total</b>	<b>150</b>		

**Table No. 5**  
**Stratification of Depression with regards to Literacy.**  
 (n = 150)

Literacy	Depression		P – value
	Yes (n=77)	No (n=73)	
Illiterate (n=83)	65	18	<b>0.000</b>
Literate (n=67)	12	55	
<b>Total</b>	<b>150</b>		

**Table No. 6**  
**Stratification of Depression with regards to occupation.**  
 (n = 150)

Occupation	Depression		P – value
	Yes (n=77)	No (n=73)	
Laborer (n=29)	00	29	<b>0.000</b>
Farmer (n=60)	28	32	
Office worker (n=11)	05	06	
House wife (n=50)	44	06	
<b>Total</b>	<b>150</b>		

**Table No. 7**  
**Stratification of Depression with regards to disease duration.**  
 (n = 150)

Disease duration	Depression		P – value
	Yes (n=77)	No (n=73)	
Up to 3 months (n=69)	12	57	<b>0.000</b>
More than 3 months (n=81)	65	16	
<b>Total</b>	<b>150</b>		

**Table No. 8**  
**Stratification of Depression with regards to site of lesion.**  
 (n = 150)

Site of lesion	Depression		P – value
	Yes (n=77)	No (n=73)	
Basal ganglia (n=61)	11	50	<b>0.000</b>
Subcortical (n=56)	39	17	
Cortical (n=33)	27	06	
<b>Total</b>	<b>150</b>		

## DISCUSSION

Our study comprised of a total of 150 patients meeting inclusion criteria of our study. Of these 150 study cases, 94 (62.7 %) were male patients while 56 (37.3 %) were female patients. Different studies have documented male gender preponderance in patients with ischemic stroke. Javed et al <sup>12</sup> from Dera Gazi Khan also reported 61 % male patients showing male gender predominance which is in compliance as that of our study results. A study conducted by Saeed et al <sup>13</sup> also reported high male gender predominance with 61.1 % in patients with ischemic stroke which is similar to our findings. Similarly Farooq et al <sup>14</sup> from Faisalabad has documented 54 % male patients with ischemic stroke which is in compliance with our study results. Sico et al <sup>15</sup> also reported 58 % male gender preponderance which is similar to our study results.

Mean age of our study cases was  $54.69 \pm 7.18$  years (with minimum age of our study cases was 44 years while maximum age was 71 years). Mean age of the male patients was noted to be  $52.02 \pm 6.14$  years while that female patients was  $59.16 \pm 6.59$  years ( $p=0.000$ ). Our study results have indicated that majority of our study cases i.e. 100 (66.7 %) were aged more than 50 years. A study conducted by Saeed et al <sup>13</sup> also reported  $64.4 \pm 11.5$  years mean age which is slightly higher than that of the findings of our study. Khan et al <sup>16</sup> reported  $58.11 \pm 15.29$  years mean age which is close to our study results. Soyama et al <sup>16</sup> from Japan also reported that mean age of men was 2.6 years higher than that of women. Our study results have documented similar findings which are in compliance with Soyama et al <sup>16</sup>. Abid et al <sup>17</sup> reported  $55.96 \pm 13.75$  years mean age of the patients presenting with ischemic stroke which is similar to that of our study results.

Of these 150 study cases, 71 (47.3 %) belonged to rural areas and 79 (52.7 %) belonged to urban areas. Monthly family income up to Rs. 50000 was noted in 89 (59.3%) while more than Rs. 50000 was noted in 61 (40.7%). Of these 150 study cases, 83 (55.3%) were illiterate and 67 (44.7%) were literate. Of these 150 study cases, 29 (19.3%) were laborers, 60 (40.0%) were farmers, 11 (7.3%) were office workers and 50 (33.3%) were house-wives. Mean duration of disease (stroke) was  $4.21 \pm 1.68$  months while 81 (54.0%) presented with more than 3 months duration. Of these 150 study cases, site of lesion in basal ganglia was 61 (40.7%), subcortical in 56 (37.3%) and cortical in 33 (22.0%). A study conducted by Khuraijam et al <sup>18</sup> also reported basal ganglia was involved in 41.1 %, subcortical in 34.4% and cortical site of lesion was noted in 20 (22.2%).

Depression was noted in 77 (51.3%) of our study cases. Vuletic et al <sup>19</sup> reported frequency of depression assessed on HADS was 55 % in patients with ischemic stroke which is close to our study results. Another study from Portugal by Caiero et al <sup>20</sup> also documented 46 % depression after ischemic stroke which is in compliance with our study results. A study from Finland also reported high frequency of depression to be 41 % after ischemic stroke which is in compliance with our study results <sup>21</sup>. Nys et al <sup>22</sup> from Netherlands reported 52 % depression among patients with ischemic stroke which is close to our study results. Saxena et al <sup>23</sup> from India has reported 57 % depression among stroke patients which is close to our study results.

## CONCLUSION

Very high frequency of depression was observed in our study among patients having ischemic stroke. Depression was significantly associated with gender, occupation, educational level, prolonged duration of illness and site of lesion. Clinicians treating stroke patients should anticipate depressive symptoms and diagnose them to treat them in early stages.

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