



## STROKE PATIENTS; MORTALITY, MORBIDITY, DISABILITY, AND INFECTION.

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**ABSTRACT...** Stroke is one of the leading factors of morbidity and mortality worldwide. To reduce the incidences of stroke, it is essential to identify and modify the risk factors for stroke. Risk factors can be modifiable and non modifiable. The aim of study was to ascertain the outcome of stroke patient admitted in all Medical Wards in Liaquat University Hospital Hyderabad **Objective:** To see the mortality, morbidity, disability and co-infection in stroke patients. **Study Design:** Prospective study. **Period:** One year. **Setting:** Medical Wards of Liaquat University Hospital Hyderabad / Jamshoro. **Material and Methods:** 200 Patients were enrolled in our study to see the excepted outcome like mortality, Disability, Bed Sores, UTI & Pneumonia and Dehydration in Stroke patients. All the patients were Young Adults, greater than 12 years in age and old aged patients, with Ischemic & Hemorrhagic stroke. On categorical variable such as sex, mortality, morbidity chi-square test was applied at 95% confidence interval and the P -value  $\leq 0.05$  was considered as statically significant while the mean  $\pm$ SD will be calculated for quantitative variables. **Results:** Mean age of the patient in our study was 57.03 years with the standard deviation of  $\pm 7.35$  years. Gender distribution shows most of the patients in our study were male, i.e. 75% while, only 25% of the patients were female. Ischemic Stroke was found in 126(63%) patients while, hemorrhagic stroke was found in 74(37%) patients. Regarding outcome, mortality was found in 5% patients, disability 2%, UTI 2%, pneumonia 15%, Co-infection 4%, Bed Sores 21.5% and dehydration was present in 50.5% patients. **Conclusion:** The study concludes that maximum patients had Ischemic Stroke. Among these patients dehydration was the most common entity followed by bed Sores, pneumonia, mortality, Co-infection, disability and UTI.

**Key words:** Stroke (Ischemic and Hemorrhagic), CT scan of Brain, Co-infection in stroke, Outcome of stroke

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### INTRODUCTION

World health organization defines stroke as "Onset of sudden focal neurological deficit lasting for more than 24 hours excluding the other causes except vascular pathology". Worldwide stroke is most frequent cause of sickness and death. Worldwide stroke is the 3<sup>rd</sup> most common etiological factor of mortality.<sup>1</sup> In underdeveloped countries due to unhealthy life the per annum incidence is about 180-300/10,000.<sup>2</sup> We should screen out the risk factors in order to reduce the incidence of stroke. Risk factors of the stroke are classified into modifiable and non modifiable risk factors.<sup>3</sup> Modifiable risk factors are hypertension, diabetes mellitus, cigarette smoking, dyslipidemia, valvular heart diseases and alcoholism.<sup>4</sup> Hypertension is the most common risk factor for ischemic stroke

as well as for hemorrhagic stroke.<sup>5</sup> Vigorous alcoholism also raises the incidence of stroke.<sup>6</sup> By controlling hypertension we can minimize the risk of recurrence of both ischemic as well as hemorrhagic stroke.<sup>7</sup> Patients having stroke may have various complications like bed sore, aspiration pneumonia electrolyte imbalances, joint contractures and dehydration. In stroke patients deaths occur most frequently due to aspiration pneumonia. Nasogastric tubing reduces the risk of aspiration pneumonia.<sup>9</sup> In order to reduce the respiratory complications patients should provide the rotational beds.<sup>8</sup> The rare complications of stroke patients are joint contractures, pressure sores, painful shoulders and falls.<sup>10</sup> The incidence of death in the patients of stroke can be reduce by preventing such complications.<sup>11</sup> Immediate

hospitalization of patients to specialized wards has been reported to reduced the incidence of deaths among stroke patients. Aim of this study is to ascertain the outcome of stroke patients admit in all Medical Wards of Liaquat University Hospital Hyderabad.

### Review of Literature

In America annually 7 lacs people of total population develop strokes, among them 5 lacs and new patient and 2 lacs are old victim of stroke. Mentality mate is 1.7 lacs wile survival is 4.5 million and among than 1 million and with different physical & mental amiabilities. Stroke is second frequent etiology of death universally. It is a big health issue and its occurrence rises with respect to risen age. As we know cardiac problems are the first major cause of mortality in America than malignancy is second cause and this disease stroke is the third major cause of mortality. In European countries fifty person mortalities occur due to stroke because of vasculopathies. The new and old causes of strokes are increasing day by day everywhere in the world. United States Association for stroke has reported that stroke is creating problems on the American economy because of its incidence and prevalence so stroke is the major problem for the health as well as economy of not only America but also for Europe and Asia.

### Objective

Objection of study was to see the mortality, morbidity, disability and co-infection in stroke patients.

### Operational definitions

Basically stroke is divided into two categories, i.e. Ischemic stroke (80-85%) and Hemorrhagic stroke (15-20%) clinically stroke is classified into following types on the basis of duration. Transient ischemic attacks "stroke in which sign and symptoms resolved within 24 hours" Stroke in evolution (progressive stroke): "Stroke in which focal neurological deficit worsens after the patient first presented". Complete stroke: "stroke in which focal neurological deficit persists and in not progressive.

According to oxford shire community stroke is classified as under:-

Total anterior circulation infarct (TACI).

Partial anterior circular infarct (PACI).

Lacunars infarct (LCAI).

Posterior circulation infarct (POCI)

## MATERIALS AND METHODS

### Study Design

Prospective study done in medical wards to LUH Hyderabad

### Setting

Medical ward Liaquat University Hospital Jamshoro/ Hyderabad

### Duration

One year

### Sample Size

200 Patients, to see the excepted outcome like mortality, Disability, Bed Sores, UTI & Pneumonia and Dehydration

## SAMPLE SELECTION

### Inclusions Criteria

Young Adults, Patients greater than 12 years in age and old aged patients, with Ischemic & Hemorrhagic stroke.

### Exclusion Criteria

Psychiatric patients, age <12 years, patients with head injuries, hepatic encephalopathy & other causes of encephalopathy

## DATA COLLECTION PROCEDURE

The study was started after approval of university ethical committee. All patients who initially present in medical ward with stroke were considered for enrollment in study. A through history was taken about the conventional risk factors and a complete physical examination was performed and stroke was defined as a sudden onset of a focal neurological deficit lasting more than 24 hours, in which causes other than vascular has been excluded. Patients were followed for

01 year to see the outcome. Blood CP+ESR, U/C/E, RBS total lipid profile, ECG. CT Scan of brain & if needed MRI was performed in all stroke patients. Patient’s information regarding bio data, clinical presentation & laboratory work was documents in Performa study. The patients was look to for Mortality, Disability, UTI & Pneumonia, Dehydration and Bed Sores

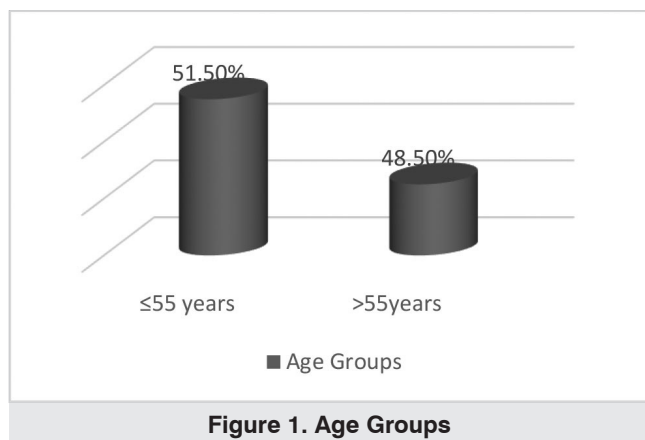
**DATA ANALYSIS PROCEDURE**

Statistical package for social science (SPSS™) version 10 was used for data analysis. Continuous variables such as age, blood pressure, were expressed as mean and standard deviation. Categorical variable such as sex, mortality, mobility were presented as frequencies & percentage. As this study is a prospective study. The chi-square test was applied on above given variable at 95% confidence interval and the P value ≤0.05 was considered as statically significant

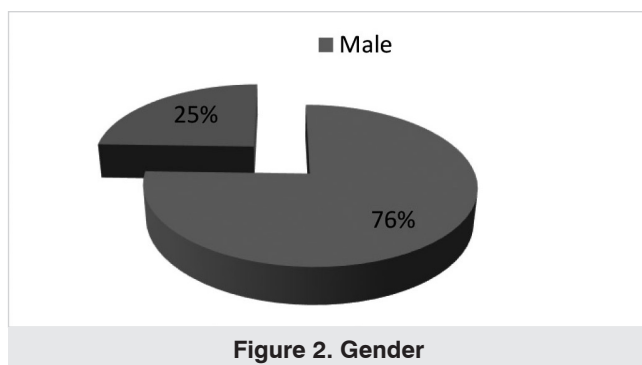
**RESULTS**

Mean age of the patient in our study was 57.03 years with the standard deviation of ±7.35 years. The minimum age of the patient in our study was 45 years while the maximum age of 65 years was noted.

Distribution of age shows 51.50% patients were of age ≤ 55 years while, 48.50% patients were of >55 years of age, as shown in (Figure 1)

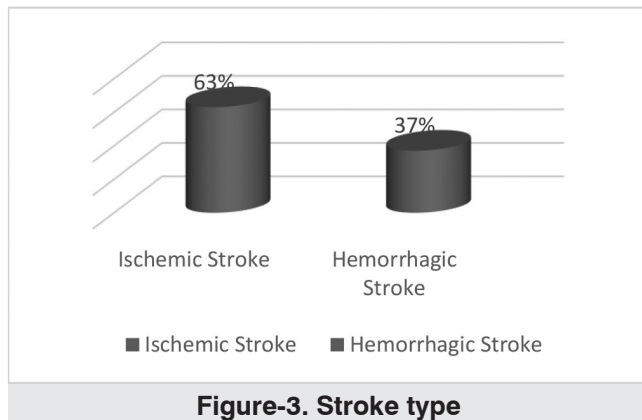


Gender distribution shows most of the patients in our study were male, i.e. 75% while, only 25% of the patients were female. (Figure 2)

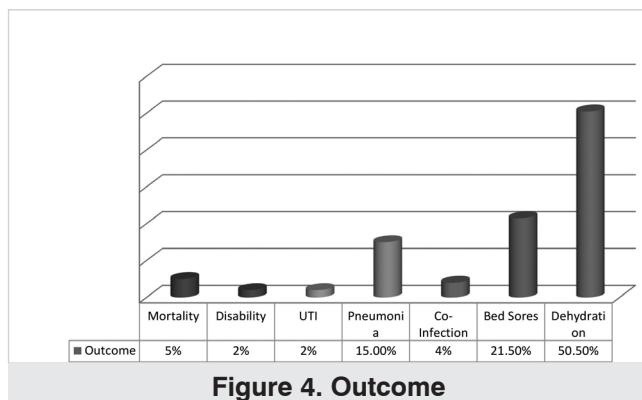


Mean systolic blood pressure was found to be 185.5mm/Hg with the standard deviation of ±7.35mm/Hg while, mean diastolic blood pressure was 106.75mm/Hg with the standard deviation of ±4.69mm/Hg.

Ischemic Stroke was found in 126(63%) patients while, hemorrhagic stroke was found in 74 (37%) patients. (Figure 3)



The outcome of the study shows that mortality was found in 10(5%) patients, disability 4(2%), UTI 4(2%), pneumonia 30(15%), Bed Sores 43(21.5%)



and dehydration was present in 101(50.5%) patients. Co-infection (UTI and pneumonia) was found in 8(4%) patients. (Figure 4)

Stratification of age group shows that 7(70%) mortality was found in the patients with age group  $\leq 55$  years while, 3 (30%) mortality was found in the patients with age group  $>55$  years. Frequency of morbidity was same in both age groups in

our study, i.e. 93(50%). In age group  $>55$  years disability was present in only 1 (25%) patients while, 3 (75%) disability was found in age group. Chi-Square test was applied to check the association of age group and Outcome of stroke and it shows that there is an association of age group and Outcome of stroke. (P-value 0.001%) (Table-I).

Age Group	Outcome						Total		P-Value
	Mortality		Morbidity		Disability				
	No.	%	No.	%	No.	%	No.	%	
$\leq 55$ years	7	70	93	50	3	75%	103	51.5	0.001
$>55$ years	3	30	93	50	1	25%	97	48.5	
<b>Total</b>	10	100	186	100	4	100	200	100	

Table-I. Age groups and outcome (n=200)

Stratification of gender shows that, 2(50%) disability was present in both male and female gender, mortality rate was higher in female gender, i.e. 8(80%) while, morbidity was found to be 147(79.03%) in males and 39(20.96%) in females. Chi-Square test was applied to check

the association of gender and Outcome of stroke and it shows that there is an association of gender and Outcome of stroke. (P-value 0.001%) (Table II). The modified Rankin Scale (mRS) in relation to gender and type of stroke is statistically significant p-value  $<0.01$  (Table III and IV).

Gender	Outcome						Total		P-Value
	Mortality		Morbidity		Disability				
	No.	%	No.	%	No.	%	No.	%	
<b>Male</b>	2	20	147	79.03	2	50	151	75.5	0.001
<b>Female</b>	8	80	39	20.96	2	50	49	24.5	
<b>Total</b>	10	100	186	100	4	100	200	100	

Table-II. Gender and Outcome n=200

Score	Gender		Total	P-value
	Male	Female		
1	01(0.7%)	02(4.1%)	03(1.5%)	$<0.01$
2	17 (11.3%)	01 (2.0%)	18(9.0%)	
3	35(23.2%)	13(26.5%)	48(24.0%)	
4	39(25.8%)	12(24.5)	51(25.5%)	
5	57(37.7%)	13(26.5%)	70(35.0%)	
6	02(1.3%)	08(16.3%)	10(5.0%)	
<b>Total</b>	151(100%)	49(100%)	200(100%)	

Table-III. Gender distribution in relation to modified Rankin Scale (mRS) n = 200

Score	Stroke		Total	P-value
	Ischemic	Haemorrhagic		
1	02(6.1%)	01(1.4%)	03(1.5%)	<0.01
2	11(8.7%)	07(9.5%)	18(9.0%)	
3	32(25.4%)	16(21.6%)	48(24.0%)	
4	21(16.7%)	30(40.5%)	51(25.5%)	
5	51(40.5%)	19(25.7%)	70(35.0%)	
6	09(7.1%)	01(1.4%)	10(5.0%)	
Total	126(100%)	74(100%)	200(100%)	

Table-IV. Modified Rankin Scale (mRS) in relation to type of stroke (n = 200)

## DISCUSSION

Epidemically stroke is a most frequent pathology among well developed European parts of the world. In under developed or developing countries 86% cause of the mortalities is stroke and it has been reported worldwide.<sup>69</sup>

In our research study we have taken 200 patients to know the possible consequences of stroke like mortality, disabilities, bed sores, urinary tract infections and pneumonia with dehydration. All the subjects were adults in young age > 12 years and also old patients having ischemic stroke as well as hemorrhagic stroke.

Demographic risk factors for stroke are sex, age and familial predisposition. Males are more affected with stroke as compared to females but mortalities are more common in females. In our study, 80% of the mortalities are found in females.

American Heart Association has reported that the chances of developing stroke are keep on increasing with respect to age and it is more frequently occurring disease in or above the age of fifty five years (AmericanHeartAssociation, 2010b).<sup>12</sup>

Mean age of the patients in our study was 57.03 years with the standard deviation of  $\pm 7.35$  years and our study is consistent with the report of Brown et al who stated that stroke is the disease of advance age people. The minimum age of the patient in our study was 45 years while, maximum age of 65 years was noted in our study. In males the incidence of stroke is more as compared to females but prevalence is more in females instead of males because there are more women in the

population, especially over the age of 70 years.<sup>13</sup> In our study 75% of the patients were males and 25% were females.

The risk of deaths is more among the patients with hemorrhagic stroke as compared to ischemic stroke.<sup>77</sup>

In current study Ischemic Stroke was found in 74 (37%) patients while, hemorrhagic stroke was found in 63% patients.

In 1999 a study was conducted on Americans and it was concluded that among 1 lac stroke patients the deaths occurred in 64 years of age and rate of mortalities was 30%.<sup>19</sup>

Consequences of current study showed 5% mortalities, 2% disabilities, 4% secondary infections and 89% morbidity. Incidence of mortality is high in the initial 1 month 12. Frequency of pneumonia in our study was found to be 15% which is consistent with many research studies in which the incidence of pneumonia was 17% to 20%.<sup>65,67</sup>

Age is the most powerfull risk factor for the development of stroke in every country of the world. People over age of 65 years mostly live in Italy. In Italy stroke is more commonly occurring disease and approximately 1.5 lacs of the patients have been found who developed stroke in every year among adult age group. In 2020 this disease will spread upto 2 lacs of total Italian population due to aging.<sup>71</sup> In 2030 the 2<sup>nd</sup> most leading cuase of the mortality will be stroke throughout the world. People having stroke if fortunately they survive than they would have physical disabilities

as well as mental problems. The care which is given to stroke patients in an special stroke unit has been debatable in the past.<sup>75,77,78</sup>

Although stroke unit care has now evidence of benefits on the life expectancy of stroke patients. Rehabilitation also prolongs the survival of stroke patients.<sup>79,80</sup>

The real difficulty is in identifying the important components and developing a transferable technology of care that can be widely applied. This could be subject to economic analysis or cost benefit analyses of the different management options. The small size of the benefits obtained by treating stroke once it has occurred is clear from this analysis. Aging is the proved risk factor for hemorrhagic stroke as well as ischemic stroke so authorities should provide effective screening programs for such patients in order to minimize both the morbidity and mortality.<sup>81</sup> In this regard primary level of prevention and screening program is must and most powerfull tool. If we do not provide primary level of prevention that we would have one option that effective management of stroke patients.<sup>82</sup> We need greater efforts to initiate rehabilitation as soon as possible and by doing this we can improve functional outcomes and would reduce dangerous consequences in the patients having stroke.

## CONCLUSION

The study concludes that maximum patients had Ischemic Stroke. Among these patients dehydration was the most common entity followed by bed Sores, pneumonia, mortality, Co-infection, disability and UTI.

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
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### AUTHORSHIP AND CONTRIBUTION DECLARATION

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