

## Outcome of stroke patients in a tertiary care hospital

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**Objectives:** To determine factors affecting the outcome of stroke and the complications that develop during the course of their stay in tertiary care hospital.

**Methodology:** It was a cross sectional study done in medicine ward, Ayub Teaching Hospital (ATH), Abbottabad, Pakistan from March 2015 to December 2016. Sample of 222 patients were selected by non-probability convenient sampling techniques. Data was collected and analyzed through SPSS version 16.

**Results:** Out of 222 stroke patients 130(58.6%) were male, 92(41.4%) were females. Mean age was 60.5±3.4 years. Diabetes mellitus was documented in 66(29.7%) while 168(75.7%) were hypertensive. Mean GCS of patients was 10.1±3.4. Average hospital stay was 5.1±3.1 days. Out of 144 improved/discharged patients, 57 were of hemorrhagic, 87 were of ischemic stroke while among expired, 51 were of hemorrhagic and 27 were ischemic stroke. 64.9% patients

improved/discharged while 35.1% expired. Out of total improved/discharged patients, 39 were diabetics while 105 were not, while among expired, 27 were diabetics and 105 were not. 20.3% patients developed bed sores while 37.8% developed aspiration pneumonia. Among 45 patients who developed bed sores, 30(66.6%) were diabetics while 177 patients those who don't develop bed sores, 36 were diabetics (20.3%).

**Conclusion:** Stroke was more prevalent among old people, male, residents of urban areas and those having history of diabetes mellitus, hypertension and smoking. Complications were aspiration pneumonia followed by bed sores, more in diabetics and those having prolong hospital stay. Worse outcome was noted among hemorrhagic stroke patients and those who presented with low GCS score. (Rawal Med J 201;42:150-153)

**Key Words:** Stroke, diabetes mellitus, aspiration pneumonia, bed sores.

### INTRODUCTION

Stroke is 3rd most common cause of mortality and disability in United States.<sup>1</sup> In modern era, because of improved survival rate and supportive measures its mortality and morbidity is falling.<sup>2</sup> It has a good survival rate once its initial time of high mortality is passed, with 50% of patients alive after 7 years of stroke.<sup>3</sup> Also, majority of them regain some level of neurological recovery but still about 30-60% survived patients are dependent in their daily activities, that's why stroke disability is still a dilemma.<sup>4</sup> Age, size and location of lesion and previous history of stroke, incontinence etc. influence the recovery of stroke<sup>5</sup> but the most important factor influencing the outcome is the mass of initial deficit.<sup>6</sup>

In practical experience length of hospital stay and discharge dispositions are used as keys of outcome

measures to compare to other predictors of recovery in stroke patients.<sup>7</sup> History of previous stroke, advance age, incontinence (fecal, urinary) etc. are indicators of poor outcomes.<sup>5</sup> Keenan et al say that ambulation is directly related to intact balance but still there is no relation with tactile sense, age, visual deficit and cognition since onset of stroke.<sup>8</sup> Regarding recovery of hemiplegic arm, initial motor deficit and position sense in the arm strongly determine its recovery.<sup>9</sup>

Treatment include thrombolytic therapy, principle of which is reopening of closed vessels which result in reperfusion of threatened tissue which improves clinical outcome in ischemic stroke, but this hypothesis is changeable.<sup>10</sup> Recanalization of large arteries may not achieve reperfusion because of persistent large distal emboli and micro vessel occlusion or recanalization may be too late to

combat ischemic changes. Recanalization may exacerbate ischemia by reperfusion injury, increased cerebral edema and may transform into hemorrhagic form. Hence, some cases series failed to correlate between recanalization and outcome.<sup>11</sup> We conducted this study in order to know the outcome of stroke patients admitted to our tertiary care unit.

## METHODOLOGY

This observational cross sectional study was conducted in all medical wards at Ayub Teaching Hospital, Abbottabad, Pakistan from March 2015 to December 2016. The sample size was calculated By WHO formula considering prevalence of stroke as ischemic in 64.9% and hemorrhagic in 35.1% cases<sup>14</sup> and Non-probability sampling technique was used. A pre-tested questionnaire consisting of questions regarding bio data, type of stroke, history of hypertension, smoking, family history of DM and hypertension, lipid profile, examination and investigation were filled by interviewers.

Those patients with stroke, having age more than 12years were included in the study. Those who had any tumor, age more than 12 years, psychiatric patients and those who have any lesion other than stroke (hemorrhagic, ischemic) were excluded from study. CT scan was performed in every patient after 24 hours after presentation to the hospital to differentiate ischemic from hemorrhagic stroke and to exclude other pathology. Data were analyzed through SPSS version 16.

## RESULTS:

Out of 222 patients, 130(58.6%) were males and 92(41.4%) were females. Mean age of patients was 60.5±3.4 years (range 23-90). Most of the patients i.e. 125(56.3%) belonged to urban areas. Diabetes mellitus (DM) was documented in 66(29.7%) while hypertension was found in 168(75.7%) patients. Of the total population, 40(18.01%) were smokers. Family history was positive for hypertension in 15(6.8%), DM in 69(31.1%), while positive family history for both hypertension and DM was documented in 42(18.9%). Out of total study population, 102(45.9%) had hemiplegia, 12(5.4%) aphasic, 48(21.6%) were unconscious at the

presentation. Dyslipidemias was noted among 53(23.8%) patients. 114(51.4%) patients had ischemic while 108(48.6%) had hemorrhagic stroke. Examination and investigations are shown in Table 1 and Table 2.

**Table 1. Examination results.**

Examination		Number	%
Pulse	Normal	195	78.8
	Tachycardia	27	12.2
Blood Pressure	Normal	162	73
	Increased	60	27
Temperature	Normal	159	71.6
	Fever	63	28.4
Respiratory Rate	Normal	129	58.1
	Tachypnea	93	41.9
Saturation	Normal	174	78.4
	Decreased	48	21.6
Motor System	Hemiplegia	183	82.4
	Aphasia	21	9.5
	Quadriplegia	12	5.4
	Increased tone, Aphasia	6	2.7
Sensory System	Intact	179	80.6
	Affected	43	19.4
Fits Observed	Present	162	72.9
	Absent	60	27.1
Nerves	Normal	165	74.3
	3 <sup>rd</sup> nerve palsy	36	16.2
	7 <sup>th</sup> nerve palsy	12	5.4
	3 <sup>rd</sup> and 7 <sup>th</sup> nerve palsy	9	4.9
Cerebellar signs	Normal	159	71.6
	Present	63	28.4
NG feeding	Yes	156	70.3
	No	66	29.7
Bed ridden	Yes	198	89.2
	No	24	10.8
Aspiration Pneumonia	Yes	84	37.8
	No	138	62.2
Other Complication	Urinary Incontinence	27	12.2
	Fecal Incontinence	30	13.5
	No other complication	165	74.3

**Table 2. Investigations.**

Investigation		Number	%
CT scan brain	Ischemic stroke	99	44.6
	Hemorrhagic stroke	108	48.6
	No changes	15	6.8
X-ray chest	Normal	108	48.6
	Aspiration pneumonia	84	37.8
	Increased cardiac silhouette	30	13.5
ECG	Normal	138	62.2
	Ischemic changes	48	21.6
	AF	36	16.2

(CT brain with no changes were also included in Ischemic stroke)

Mean GCS of patients was  $10.1 \pm 3.4$  (range 3-15). Average hospital stay was  $5.1 \pm 3.1$  days (range 1-14). Out of 144 improved/discharged patients, 57 were of hemorrhagic and 87 ischemic stroke. The mortality in among expired, 51 were of hemorrhagic stroke and 27 ischemic stroke. Out of total improved/discharged patients, 39 were diabetics, while among expired, 27 were diabetics. Complications other than bed sores (20.3%) and aspiration (37.8%) were urinary incontinence 27(12.2%) and fecal incontinence 30(13.5%).

Among those with GCS 3-6/15 at presentation, 36 patients expired while 3 improved, those with GCS 7-10/15, 24 patients expired while 60 improved, and those having GCS more than 10/15, 81 patients improved while 18 expired ( $P < 0.05$ ). Those patients with hospital stay of 1-3 days, 24 developed aspiration 60 didn't, while 9 developed bed sores. Those with hospital stay of 4-6 days, 30 developed aspiration and 12 developed bed sores. Those with hospital stay of 7-10 days, 24 developed aspiration and those with hospital stay of >10 days, 6 developed aspiration pneumonia while 6 developed bedsores ( $P < 0.05$ ). Complications of stroke observed are shown in Fig: 3 below.

**Table 3. Details of outcome in different complications.**

Outcome			Aspiration		Total
			Yes	No	
Discharged	Bedsore	Yes	9	3	12
		No	33	99	132
	Total		42	102	144
Expired	Bedsore	Yes	24	9	33
		No	18	27	45
	Total		42	36	78

Among those who developed bed sores i.e. 45 patients 30(66.6%) were diabetics while those who don't develop bed sores i.e. 177 patients 36 were diabetics (20.3%), which shows association between diabetics and bed sores development ( $P < 0.05$ ) (Table 3).

## DISCUSSION

Stroke kills 17.3 million people worldwide annually. In our study, mean age of patients was  $60.5 \pm 3.4$  years, 58.6% male, 41.4% females, 29.7% diabetics, 75.7% hypertensive. This similar to other studies. A study showed 50% study population as hypertensive and 18% diabetic;<sup>12</sup> another showed 58% male affected by stroke, 42% females and mean age of affected stroke population as 57.8 years.<sup>13</sup> Others showed mean age of 60.9 years, diabetics 20% and 52% hypertensive,<sup>14</sup> mean age of 63.42%, diabetes 20% and hypertension 60% in stroke population.<sup>15</sup> Ahmad et al. found 58% male, 42% female affected by stroke and among them 68% population presented with chief complaints of hemiparesis in their study from Lahore.<sup>16</sup> Our population presented with chief complaint of hemiplegia (45.9%). This small difference is because hemiplegia is less prevalent than hemiparesis.

Our study showed complications rate of 20%. 3% patients developed bed sores, 37.8% developed aspiration pneumonia and 35.1% patients expired most of them were those who developed some sort of complication. A study from Lahore showed pneumonia in 28% population, bed sores in 40% while expiry was noted in 12% patients.<sup>17</sup> In our study, we noted 18.01% patients had smoking

history while 23.8% had dyslipidemias, comparable to 16% as smokers and 18% having dyslipidemias.<sup>17</sup> Our results showed that 51.4% patients had ischemic while 48.6% had hemorrhagic stroke. Different studies have showed their own figures regarding type of stroke like 69% ischemic 31% hemorrhagic,<sup>12</sup> 64.9% ischemic 35.1% hemorrhagic,<sup>13</sup> 64% ischemic 36%hemorrhagic.<sup>15,16</sup> This very high incidence of hemorrhagic stroke in our study population may be due to increased morbidity like unconsciousness and other fatal complications as our population is mostly from the hilly areas of Mansehra, Batagram, Besham and Kohistan that seek medical advice. Some differences are present in comparisons between different studies and also in comparing them with ours, which may be due to inter observer bias, differences between study populations and their characteristics as well as in hospitals like some studies are done in secondary level of care like that from DI Khan.<sup>15</sup>

## CONCLUSION

Our study showed that stroke was more prevalent among old people, male, residents of urban areas and those with history of diabetes mellitus, hypertension and smoking. Most common presentation was hemiplegia. Most patients were bed ridden and were on NG feeding. Hemorrhagic stroke was more prevalent than ischemic stroke. Most common complication was aspiration pneumonia followed by bed sores. Complications were more in diabetic patients and those with prolonged hospital stay. Worse outcome was noted among hemorrhagic stroke patients and those who presented with low GCS score.

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