Research Article

In-Hospital Outcome of Stroke at a Divisional Hospital of Pakistan

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Abstract

Background: Stroke having two major types, is a clinical presentation which presents loss of brain function; risk factors & complications may vary and which ultimately can lead to death.

Objective: To determine stroke outcome and its association with factors and complications.

Methods: Observational cross-sectional study, conducted from Nov 2015 to Aug 2016 at DHQ Teaching Hospital, KMU Institute of Medical Sciences, Kohat. A pre-designed questionnaire was adopted for data extraction. SPSS 25.0 was used; descriptive and inferential statistics were applied where needed

Results: From 100 patients, male were 54% with mean age of 67.48±13.77 years, having 88% Ischemic stroke patients. Hypertension (79%) and family history (39%) were major risk factors while constipation (59%) and aspiration pneumonia (44%) were major complications with in-hospital mortality of 10%. The factors had a higher Prevalence Ratio (PR) for drug abuse (1.330), hypercholesterolemia (1.166), and hypertension (1.036) in ischemic stroke, while in hemorrhagic stroke PR was high for family history (1.918), heart diseases (1.173) and sedentary lifestyle (1.030). In complication, ischemic stroke had a higher PR for constipation (0.996), while hemorrhagic stroke had a higher PR for bed sores (3.286). The results shows an overall mortality of 10% only.

Conclusion: The study concluded in-hospital mortality with ischemic stroke more common then hemorrhagic stroke. Hypertension and constipation were a prevalent risk factor and complication respectively. Family history, heart diseases, sedentary lifestyle and all complications were associated more with the hemorrhagic stroke while all other risk factors and no complications had a higher association with ischemic stroke.

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Key Words: Ischemic stroke; Hemorrhagic stroke; Risk factors; Complications; Fatal outcome.

Introduction:

Stroke is one of the clinical syndrome having symptoms/signs of focal (sometimes global) loss of brain function, the symptoms may last for more than 1 day or may lead to death with only apparent cause of vascular origin[1-2]. As per World Health Organization report 2002 total mortality rate in Pakistan due to stroke was 78512, which by 2020 is expected to rise double mainly due to increase in the proportion of older people and current smoking patterns in developing countries like ours[3-4]. It is a worldwide number one cause of disability and number 3 cause of mortality and morbidity in US[5-6]. The disease stroke is a huge burden to the economy of a country in terms of expenditure and treatment of the disease and also minimizing disability through rehabilitation[1]. The advancement of medical knowledge has improved survival rate while supportive measures are also playing its role in decreasing morbidity and mortality due to this disease after initial critical time[6]. Majority surviving the initial damage is mostly dependent due to some level of neurological deficit which depends upon age, size, location of the lesion and previous history of stroke, etc of which mass of initial deficit with recovery is an impor-

tant parameter for dependence[7].

Our country Pakistan shares a significant burden of this fatal disease, wasting much of our energy in all sectors[8]. The reason for this can be that Asian countries have been recognized to have an increasing incidence of hypertension and diabetes which are major risk factors of stroke[9]. The duration of stay at the hospital and disposition at the time of discharge are the most important factors determining the outcome in which previous stroke, the advancement of age, bedsores, infections are said to be bad prognostic signs[10]. Different local studies in Pakistan have identified the risk factors and complications related to stroke which were found variable as per geological, ethnicity and living off that area[11-12].

Stroke is a preventable disease, different stroke specialist, health researchers and clinicians are immensely focusing to minimize and reduce modifiable risk factors leading to stroke and have achieved a good bit of results in that while the treatment, rehabilitation & post-stroke care is also being questioned in various studies to minimize complications related to it. Local literature and studies on stroke published in Pakistan are scare. So, this study will help to associate different risk factors and complications with different types of strokes reported to hospital from district Kohat, which will be the source for primordial prevention, treatment, and rehabilitation of disease. To determine stroke outcome and its association with risk factors and complications in the Divisional Hospital of Khyber Pakhtunkhwa.

Methods:

This observational cross-sectional study was conducted from Nov 2015 to Aug 2016 after taking approval for Institution Review & Ethical Board KIMS, Kohat and a sample of 100 different stroke cases admitted in Medicine Department at District Headquarter Teaching Hospital, KMU Institute of Medical Sciences, Kohat was taken. The sample size was calculated from a sample population of local study by Kamal A13 et al with 95% CI, 1% margin of error and response distribution of 50% (estimated prevalence) via online raosoft sample size calculator, the sample size was 94, however 100 patients were enrolled. A predesigned questionnaire with informed consent which was translated in local languages like Urdu, Pashto and Hinko was used to get bio-data and required information. Those patients with stroke having age above 12 years were included, while patients with psychiatric illness, cancer and lesion elsewhere were excluded. CT brain was performed to differentiate between types of stroke (ischemic and hemorrhagic). The analysis was done using SPSS 25.0 mean ± standard deviation were calculated for numerical variables like an age while frequencies and percentages were calculated for all categorical variables. Prevalence Ratio was used to measure the strength of association, while difference in means of more than two variables was tested using One-Way ANOVA. P-value of ≤0.05 was taken as significant.

Results:

In a sample of 100 subjects, 54 (54%) were male while 46 (46%) were female with a mean age of 67.48±13.77 years. 88 (88%) subjects were found to have an ischemic stroke while 12 (12%) subjects were having a hemorrhagic stroke. Where male gender has an ischemic stroke in 90.7% & hemorrhagic stroke in 9.3% while the female gender has 84.8% ischemic stroke and 15.2% has a hemorrhagic stroke. Only 11(11%) patients were found to be below 50 years old and only 3 (3%) patients were below 40 years complications representing it as a disease of old age.

Among risk factors, hypertension was found to be a major risk factor in 79 (79%) of patients, followed by a family history of such diseases in 39 (39%) while 34 (34%) of patients living sedentary lifestyles had a stroke. Diabetes 31 (31%) and prior stroke, TIA 30 (30%) also contribute to important risk factors for stroke. The prevalence ratio factors with different stroke types is given in Table no 1.

Among the complications noted 59 (59%) patients had constipation while 44 (44%) aspiration pneumonia, 27 (27%) coma and 14 (14%) had urinary tract infection. The prevalence ratio of different complications with different stroke types is given in Table no 2.

In outcome 90 (90%) patients were discharged while remaining 10 (10%) died during the treatment. Figure no 1 shows that all deaths occurred were of above age 55 years with a mean of 69.50 ± 4.20 years and 9 (90%) of total died either at age of 60 or above ,while in total

Table 1: *Relationship of different risk factors with ischemic and hemorrhagic storke separately (n=100)*

Risk Factors		Ischemic Stroke		Prevalence Ratio	Hemorrhagic stroke		Prevalence Ratio
		Yes	No		Yes	No	
Family History	Yes	36	3	0.923	3	36	1.918
	No	52	9		9	52	
Tobacco Smoking	Yes	21	3	1.008	3	21	0.947
	No	67	9		9	67	
Drug Abuse	Yes	2	1	1.330	1	2	0.340
	No	86	11		11	86	
Hypertension	Yes	69	10	1.036	10	69	0.752
	No	19	2		2	19	
Diabetes	Yes	27	4	1.015	4	27	0.899
	No	61	8		8	61	
Obesity	Yes	14	2	1.007	2	14	0.952
	No	74	10		10	74	
Hypercholesterolemia	Yes	10	3	1.166	3	10	0.448
	No	78	9		9	78	
Sedentary lifestyle	Yes	30	4	0.996	4	30	1.030
	No	58	8		8	58	
Thrombolytic drugs	Yes	7	1	1.006	1	7	0.957
	No	81	11		11	81	
Prior Stroke	Yes	26	4	1.022	4	26	0.857
	No	62	8		8	62	
Heart Diseases	Yes	17	2	0.980	2	17	1.173
	No	71	10		10	71	

Table 2: *Relationship of different complications with ischemic and hemorrhagic storke separately (n=100)*

Complications		Ischemic Stroke		Prevalence Ratio	Hemorrhagic stroke		Prevalence Ratio
		Yes	No		Yes	No	
Constipation	Yes	52	7	0.996	7	52	1.028
	No	36	5		5	36	
Urinary Tract Infection	Yes	13	1	0.939	1	13	1.791
	No	75	11		11	75	
Aspiration Pneumonia	Yes	40	4	0.943	4	40	1.571
	No	48	8		8	48	
Post Stroke Seizures	Yes	10	1	0.964	1	10	1.360
	No	78	11		11	78	
Bed Sores	Yes	22	1	0.896	1	22	3.286
	No	66	11		11	66	
Coma	Yes	24	3	0.986	3	24	1.110
	No	64	9		9	64	

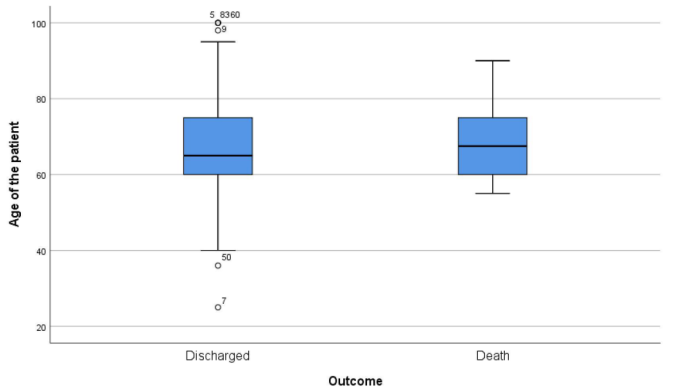

Figure 1: *Box plot between age of the patient and death (n=100)*

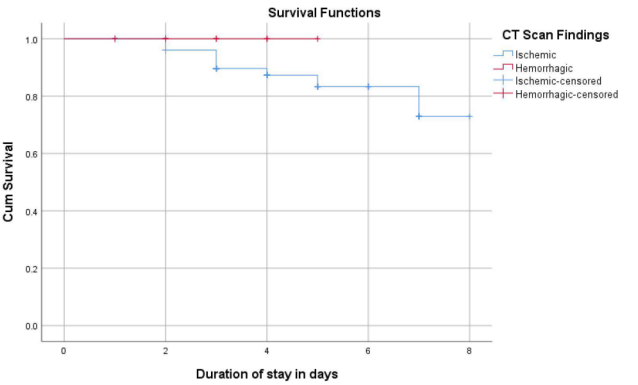

Figure 2: *Kaplan-Meier survival graph for ischemic and hemorrhagic stroke outcome with duration of stay (n=100)*

deaths, 7 (70%) occurred within 3 days of admission at Hospital. Three (3%) of patients had a recurrent stroke during their admitted time after the diagnosis of the first one. Eighty-seven (87%) of patients either died or were discharged from hospital within the first week of treatment while remaining 13 (13%) were kept for more than 7 days then either discharged, referred or died with a duration of stay as 3.48±1.79 days for ischemic stroke and 2.67±1.23 days for a hemorrhagic stroke patient. The duration of stay had no impact on the outcome with a p-value of 0.760 (ONE WAY ANOVA TEST) and shown in Fig # 2 as Kaplan-Meier survival graph for both types of stroke clearly showing that all deaths were in patients of ischemic stroke.

Discussion:

Annualy 17.1 million people dies of Stroke per annum globally. Mean age of the participants in this study was 67.48±13.77 years with male cases than female (1.17:1), which are in with Zaman H, et al study from the study area[5].

Among the risk factors, this study showed hypertension as the most common risk factor existing in 79% of the patients which is similar to other regional studies however the percentages may differ[6,12-16]. Family history and sedentary lifestyle were found to be other associated risk factor following hypertension, on which limited literature exists however our results are in contradiction with a study from Karachi[1]. Among other risk factors extracted from this study diabetes › smoking › heart diseases › hypercholesterolemia which is in contradiction with other studies.13 However, less literature is available on risk factors like drug abuse, thrombolytic drugs, obesity and prior stroke as risk factors. Table # 3 shows risk factors causing stroke and its percentages from different Middle East countries.

Stroke being highly morbid in nature causes many complications and as per this study results constipation (59%) followed by aspiration pneumonia 44% were found to be major complications which contradicts with study conducted at AMI, Abbotabad[5]. In other complications like UTI our study is in similarity with study conducted Wang P, et al[17]. the complication UTI followed pneumonia.

The study shows a higher prevalence ratio for family history in hemorrhagic with a Prevalence Ratio (PR) of 1.918, showing a higher incidence of hemorrhagic stroke in patients with positive family history. This result is in accordance with a study result conducted at US on 30,239 patients showing a higher association of family history for stroke particularly ischemic[18]. Heart diseases was among another common risk factor having an PR of 1.173as per this study results, which are almost in similarity with a study conducted as Spain showing an associations with an odds of 1.33 of heart disease for stroke[19]. The study also evaluated the strength of association for risk factors in ischemic stroke patients as well, where drug abuse was found to be among common risk factor for hemorrhagic stroke with a PR of 1.330, this result is against many studies conducted which shows dyslipidemia as one of the most common risk factor for ischemic stroke with an association of 2.503.20 This study also reported the decrease strength of PR for hypercholesterolemia (1.166) as reported in literature but it is again an important risk factor for ischemic stroke.

Among complications bed sores had a highest PR in hemorrhagic stroke with a value of 3.286, while in literature infections of either system i.e respiratory or urinary leads the chart for higher odds when it comes to hospital based complications with stroke[21]. The reason behind this may be lack of nursing care in Pakistani government hospital setups leading to more pressure ulcers than reported in literature. In comparison constipation was found to have highest PR for hemorrhagic stroke, the same has been reported by a meta-analysis of 8 studies reporting high rate of constipation among hemorrhagic stroke patients[22].

The study is unique and first of its type in the region that determined relationship of different factors with both types of stroke. However, small sample size was a limitation of this study and it is recommended to conduct the same study on a bigger population.

Conclusion:

In-hospital mortality was recorded in the study, wherein ischemic stroke was more common than hemorraghic stroke. Among risk factors hypertension was most common while in complications constipation was more prevalent than others. Family history, heart diseases, sedentary lifestyle and all complications were asso-

ciated more with the hemorrhagic stroke while all other risk factors and no complications had a higher association with ischemic stroke

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