Original Article

Pattern of Different Types of Cerebral Stroke in Faisalabad

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ABSTRACT

Objective: To determine the frequency of different types of stroke in patients with cerebral stroke presenting in DHQ hospital Faisalabad. **Study Design:** Cross Sectional Descriptive Study. **Setting:** Study was conducted in Medical Unit IV DHQ Hospital Faisalabad between 01-06-2014 to 30-11-2014. **Materials and Methods:** 100 patients both male and female of ages more than 16 years admitted with acute stroke with in and after 24 hours of stroke and patients having infarction, hemorrhage and subarachnoid hemorrhage as a cause of stroke diagnosed on Computerized Tomography (CT) scan of the brain were included in the study. After Informed Consent, data collection was carried out after taking history, performing clinical examination and doing investigations. Data was analyzed by using Chi-Square test at 5 % level of significance. Statistical analysis was carried out with the use of SPSS Version 21 for Windows. In this study, frequencies of major categories of stroke were found out in relation to different age groups and sex. Hypertension and association between frequencies of various categories of stroke and Diabetes Mellitus, Hypertension and association between frequencies of Diabetes various categories of stroke and irregularly treated Hypertension and Diabetes Mellitus were found out. **Results:** Our research found the frequency of Infarctive stroke, Intracerebral bleed and Sub-arachnoid hemorrhage as 62 %, 28 % and 10 % respectively. Correlation of gender with major categories of stroke was found to be statistically significant. Peak age range for cerebral infarction was found to be 51-60 years accounting for 22 cases (i.e. 35.48 % of all cerebral infarction cases), peak age range for intracerebral bleed was also 61-70 accounting for 12 cases (i.e. 42.86% of all intracerebral bleed patients) and peak age range for Sub-arachnoid hemorrhage was 41-50 accounting for 4(40%) cases. Infarctive stroke was also found in the lowest age range i.e. 21-30 accounting for 3 cases. Patients with uncontrolled Hypertension and Diabetes Mellitus were found to be at more risk of developing cerebral stroke. **Conclusion:** Infarctive Stroke is more common in our study as compared to hemorrhagic Stroke. Proper awareness and treatment about the major risk factors of stroke such as hypertension and diabetes mellitus can help to reduce the episodes of stroke in population. Patients need proper education about modifiable risk factors for cerebral stroke. **Key Words:** Cerebral Stroke, Hypertension, Diabetes Mellitus

INTRODUCTION

A stroke, sometimes referred to as a cerebrovascular accident (CVA), is the rapid loss of brain function due to disturbance in the blood supply to the brain. This can be due to ischemia (lack of blood flow) caused by blockage (thrombosis, arterial embolism), or hemorrhage.[1] Thus, the definition of stroke is clinical, and laboratory studies including brain imaging are used to support the diagnosis. The clinical manifestations of stroke are highly variable because of the complex anatomy 0f the brain and its vasculature. Among all deaths, 40-50% are due to vascular events of which 10% are due to stroke.[2] More than two-thirds of the global burden of stroke is borne by

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developing countries, especially Asia, where the average age of patients with stroke is 15 years younger than in developed countries.[3] According to Pakistan Stroke Society, the estimated stroke incidence in Pakistan is close to 250 per 100,000 population, which means that there are 350,000 new stroke patients every year in this country.[4] Cerebral Infarction is caused by a reduction in blood flow that lasts longer than several seconds. Neurologic symptoms manifest within seconds because neurons lack glycogen, so energy failure is rapid. If the cessation of flow lasts for more than a few minutes, it results in infarction or death of brain tissues. Intracranial hemorrhage is caused by bleeding directly into or around the brain; it produces neurologic symptoms by producing a mass effect on neural structures, from the toxic effects of blood itself, or by increasing intracranial pressure[1, 2]. The main pathological types of stroke are cerebral infarction, primary intra-cerebral hemorrhage and subarachnoid hemorrhage. In developed countries, about 85 to 90% of strokes are due to cerebral infarction and 10 to 15% due to intracranial hemorrhage.[4] In one of the study, it was found that Cerebral Infarction was found in 68% of the patients, Cerebral Hemorrhage in 31% of the patients and Sub-Arachnoid Hemorrhage in 1% of the patients.[4] In another study Cerebral infarction was present in 72% of the patients while cerebral hemorrhage was present in 28% of the patients.[5] Hypertension was the most common risk factor among these stroke patients.[5]

The rationale of our study was to determine the frequency of different types of strokes in patients presenting in our hospital and their relationship with various risk factors such as diabetes mellitus and hypertension so as to create awareness in the general public regarding early and appropriate treatment of these factors.

OBJECTIVE

To observe prevalence of major categories of stroke in stroke patients.

MATERIALS & METHODS

This Cross-Sectional Descriptive Study was conducted in Medical Unit-IV, District Headquarters (DHQ) Hospital Faisalabad between 01-06-2014 to 30-11-2014. 100 patients both male and female of ages more than 16 years admitted with acute stroke after 24 hours of stroke and patients having infarction, hemorrhage and subarachnoid hemorrhage as a cause of stroke diagnosed on Computerized Tomography (CT) scan of the brain were included in the study. Patients with stroke secondary to space occupying lesions and blood dyscrasias were excluded from the study. After Informed Consent, data collection was carried out after taking history, performing clinical examination and doing investigations including Complete Blood Count, Complete Urine Examination, ECG and CT scan of the Brain.

Data was analyzed by using Chi-Square test at 5 % level of significance. Statistical analysis was carried out with the use of SPSS Version 21 for Windows. In this study, frequencies of major categories of stroke were found out in relation to different age groups and sex. In this study variables of interest were Diabetes Mellitus, Hypertension and association between frequencies of various categories of stroke and irregularly treated Hypertension and Diabetes Mellitus were found out.

RESULTS

Our research found the frequency of Infarctive stroke, Intracerebral bleed and Sub-arachnoid hemorrhage as 62 %, 28 % and 10 % respectively. Assessment of correlation of major categories of stroke was done with respect to gender, age groups, hypertension and diabetes mellitus. Correlation of gender with major categories of stroke was found to be statistically significant. According to our data there were 52 males and 48 females. Out of 52 males 32 cases (i.e. 51.61 % of all the infarctive stroke patients) had Infarctive stroke, 12 cases (i.e. 42.86% of all the intracerebral bleed patients) had Intracerebral bleed and 8 cases (i.e. 80% of all the sub-arachnoid patients) had Sub-arachnoid hemorrhage. Out of 48 females 30 cases (i.e. 48.38 % of all the infarctive stroke patients) had Infarctive stroke, 16 cases (i.e. 57.14 % of all the intracerebral bleed patients) had Intra-cerebral bleed and 2 cases (i.e. 20% of all the Sub-arachnoid patients) had Sub- arachnoid hemorrhage. Similar patterns were seen in both males and females in regard to the percentages of

Infarction, Intracerebral bleed and Sub-arachnoid hemorrhage, although intracerebral bleed was seen more in females as compared to males.

Major categories of stroke had no statistical correlation with various age groups. Peak age range for cerebral infarction was found to be 51-60 years accounting for 22 cases (i.e. 35.48 % of all cerebral infarction cases), peak age range for intracerebral bleed was also 61-70 accounting for 12 cases (i.e. 42.86% of all intracerebral bleed patients) and peak age range for Sub-arachnoid hemorrhage was 41-50 accounting for 4 cases (i.e. 40 % of all Sub-arachnoid hemorrhage patients. Infarctive stroke was also found in the lowest age range i.e. 21-30 accounting for 3 cases (i.e. 4.84 % of all cerebral infarction patients).

Correlation between hypertensive status and stroke was also found to be statistically non-significant i.e. no correlation existed between two variables. Yet cerebral infarction and Intracerebral bleed was found to be more common in patients who were hypertensive but took medication irregularly accounting for 28 cases (i.e. 45.16 % of all the cases of cerebral infarction) and accounting for 15 cases(i.e. 53.57 % of all cases of intracerebral bleed) respectively.

Sub-arachnoid hemorrhage was found most commonly in non-hypertensive patients accounting for 5 cases (50% of all cases of sub-arachnoid hemorrhage). Interestingly, in non-hypertensive patients, cerebral infarction was most common accounting for 18 cases (i.e. 29.03 % of all cases) of cerebral infarction.

In the end, correlation between diabetic status of patients and various categories of stroke was also found to be non-significant statistically i.e. no correlation existed between the two variables. Yet, cerebral infarction was found to be most common in diabetic patients taking medications irregularly accounting for 26 cases (i.e. 41.93 % of all cases of cerebral infarction). Intra cerebral bleed was found to be most common in non-diabetic patients accounting for 18 cases (i.e. 64.29 % of all the cases of intra cerebral bleed) and Sub-arachnoid hemorrhage was also found to be most common in non-diabetic patients accounting for 9 cases(90 % of all the cases of Sub-arachnoid hemorrhage).

Table 1: Stroke in Relation to Gender

Gender	Cerebral infarction		Intra cerebral bleed		Subarachnoid hemorrhage		Total
	No of pt.	%age	No of pt.	%age	No of pt.	%age	
Male	32	51.61	12	42.86	8	80	52
Female	30	48.38	16	57.14	2	20	48
Total	62	-	28	-	10	-	100
Chi-square $_{cal}$ .360[a]				Chi-square $_{tab}$ 3.84			

Table 2: Distribution of Pattern of Stroke in Different Age Groups

			Types of Stroke			Total
			Infarctive Stroke	Hemorrgic Stroke	Sub-Arachinoid Hemorrge	
Age of Patients	21-30	Count	3	1	1	5
		% within Age of Patients	60.0%	20.0%	20.0%	100.0%
		% within Types of Stroke	4.8%	3.6%	10.0%	5.0%
		% of Total	3.0%	1.0%	1.0%	5.0%
	31-40	Count	11	6	2	19
		% within Age of Patients	57.9%	31.6%	10.5%	100.0%
		% within Types of Stroke	17.7%	21.4%	20.0%	19.0%
		% of Total	11.0%	6.0%	2.0%	19.0%

	41-50	Count	13	6	4	23
		% within Age of Patients	56.5%	26.1%	17.4%	100.0%
		% within Types of Stroke	21.0%	21.4%	40.0%	23.0%
		% of Total	13.0%	6.0%	4.0%	23.0%
	51-60	Count	22	3	1	26
		% within Age of Patients	84.6%	11.5%	3.8%	100.0%
		% within Types of Stroke	35.5%	10.7%	10.0%	26.0%
		% of Total	22.0%	3.0%	1.0%	26.0%
	61-70	Count	13	12	2	27
		% within Age of Patients	48.1%	44.4%	7.4%	100.0%
		% within Types of Stroke	21.0%	42.9%	20.0%	27.0%
		% of Total	13.0%	12.0%	2.0%	27.0%
Total		Count	62	28	10	100
		% within Age of Patients	62.0%	28.0%	10.0%	100.0%
		% within Types of Stroke	100.0%	100.0%	100.0%	100.0%
		% of Total	62.0%	28.0%	10.0%	100.0%

Table 3: Stroke in Relation to Hypertension

Medication	Cerebral infarction		Intra cerebral bleed		Subarachnoid hemorrhage		Total
	No of pt.	%age	No of pt.	%age	No of pt.	%age	
On Regular medication	16	25.81	4	14.28	0	0	20
On Irregular medication	26	41.93	6	21.43	1	10	33
Non hypertensive	20	32.25	18	64.29	9	90	47
Total	62	-	28	-	10	-	100
Chi-square $_{cal}$ 19.360[a]					Chi-square $_{tab}$ 3.84		

Table 4: Stroke in Relation to Diabetes

Medication	Cerebral infarction		Intra cerebral bleed		Subarachnoid hemorrhage		Total
	No of pt.	%age	No of pt.	%age	No of pt.	%age	
On Regular medication	16	25.81	8	28.57	0	0	24
On Irregular medication	28	45.16	15	53.57	1	10	44
Non diabetic	18	29.03	5	17.86	9	90	32
Total	62	-	28	-	10	-	100
Chi-square $_{cal}$ 19.360[a]					Chi-square $_{tab}$ 5.99		

DISCUSSION

At the beginning of 21st century and emerging of new era, cerebrovascular disease is a major cause of death and disability worldwide. In our study the frequency of cerebral infarction in present research was found out to be 62 % which is approximately similar to that of study conducted by Alam et al[5]. In our study the frequency of cerebral hemorrhage was found out to be 28% which is approximately similar to that of study conducted by Khan SN.[7] Sub-Arachinoid Hoemorrhae(SAH) was found to more common in

males as compared to females. This finding was similar to study conducted by Awan LM et al[8] Hypertension is found to be one of the leading cause of stroke in our study. Hypertension was found to present in 67% patients with ischemic stroke while in study conducted by Basharat Z[9] it was found in 86.8% of the patients with ischemic stroke. Hypertension was found in 35.7% of patients with Intracerebral bleed. Stroke was found to be more in patients irregularly taking medication for hypertension accounting for 45.1% of the patients with infarctive stroke and for 53.5% hemorrhagic stroke indicating the increased chances of hemorrhagic stroke in patients with uncontrolled hypertension. This finding has also been reinforced in a study conducted by Lohano AK[10] .Diabetes Mellitus and another important risk factor for stroke was found in 38 % of the patients while in a study by Alam I[5] diabetes mellitus was found in 28% of patients with stroke. All sub-types were seen more in diabetic patients taking medications irregularly. Thus our study stresses upon the need of proper control of hypertension and diabetes mellitus in order to prevent a debilitating disease i.e. stroke.

Further research is required to find out more about other factors involved, prevalence of stroke on a larger scale, dietary habits, non-compliance for medications and life styles.

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Further research is required to find out more about other factors involved, prevalence of stroke on a larger scale, dietary habits, non-compliance for medications and life styles.

CONCLUSION

Stroke is very prevalent in our country. Infarctive Stroke is more prevalent as compared to hemorrhagic Stroke. Our Study suggests that proper awareness and treatment about the major risk factors of stroke such as hypertension and diabetes mellitus can help to reduce the episodes of stroke in population. Patients need proper education about modifiable risk factors for cerebral stroke. They should be informed about deleterious effects of hypertension, diabetes mellitus and other risk factors for stroke. These factors are to be worked with and further research should be done about prevention of stroke which is one of the leading killers in today`s world.

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Submitted for Publication: 16-08-2014

Accepted for Publication: 02-11-2014