RISK FACTORS FOR HYPERTENSION IN PATIENTS WITH STROKE PRESENTING TO TERTIARY CARE HOSPITAL

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ABSTRACT

OBJECTIVES

To determine the risk factors for hypertension in stroke patients presenting to the tertiary care hospital of Peshawar, Pakistan.

METHODOLOGY

This cross-sectional descriptive study was conducted in the Department of Medicine at Khyber Teaching Hospital, Peshawar. This study spanned months and included 225 patients of either gender who had stroke symptoms within the preceding 72 hours. Detailed information was documented in age (in years), residence, gender, educational qualification, family history of hypertension, smoking, diabetes mellitus, obesity, dyslipidemia, hypertension, and duration. SPSS version 26.0 was used.

RESULTS

The age range of the participants were from 41 to 80 years, with a mean age of 61.004±6.69. The mean duration of hypertension was 3.052±0.85 years. Hypertension was seen in 42.2% of patients. Factors leading to hypertension in stroke patients were age 40.8%, urban area 42%, illiteracy 36.2%, positive family history 61.9%, diabetes mellitus 65.2%, smoking 33.3%, obesity 85.3%, and dyslipidemia 71.8%.

CONCLUSION

Significant risk factors for stroke include hypertension, diabetes mellitus, hypercholesterolemia, smoking, obesity, an d positive family history.

KEYWORDS: *Stroke, Hypertension, Risk factors*

INTRODUCTION

Stroke is a sudden onset focal cerebral dysfunction resulting from vascular disease of the brain.[1] Stroke is the third most typical cause of disability, following ischemic cardiac disease and innate disorders.[2] Stroke is defined as a patient presenting with one or more of the following: Dysphagia, Dysarthria /Aphasia, Weakness in one or more limbs, Disorientation/decreased level of consciousness (GCS <15) and confirmed on computerized tomography (C.T). The brain shows hypo/hyperdense lesions in the brain. According to U.S. statistics, stroke is the sixth most common cause of death and disability.[3] Pathologically strokes are classified into infarcts (ischemia) and haemorrhages (bleeding). About 80% of cerebrovascular accidents (CV A) in Europe are caused by cerebral ischemia, and 20% are due to hemorrhages.[4] Due to its widespread prevalence worldwide, high blood pressure remains the leading public health concern.[5] According to demographic data, 7.5 million fatalities annually, or 12.8% of all deaths worldwide, are attributed to high blood pressure, and by 2025, that number is expected to rise to 1.56 billion adults.[6] A statistics study from Pakistan found that hypertension is a significant risk factor for stroke, with a frequency of 56 %.[7] Another national study data showed that 37.5% of males and 41% of females aged 50-59 had increased pressures in vessels associated with ischemic stroke.[8] Apart from hypertension as the leading cause, several other factors also play a significant role in the pathogenesis of cerebrovascular accidents (CVA). Moreover, the prevalence of hypertension modifies diversely with alterations in factors like elderly age, city living hood, economic growth, stressful life, sedentary lifestyle, and poor dietary habits.[9] The following factors are associated with hypertension in stroke: old age: Age above 60 years 2. Urban living 3. Illiteracy 4. Positive family history: Father/mother/sibling known hypertensive 5. Diabetes mellitus: Documented history of Diabetes mellitus or on anti-diabetic medications for ≥ 3 months 6. Smoking: a) Current smoker: A person who currently smokes cigarettes and has smoked 100 cigarettes or more in their lives b) Former smoker: An adult person who has smoked 100 cigarettes in their lifetime but has stopped smoking at the time of interview 7. Obesity: BMI (Body mass index) of 30 or more with excessive adipose tissue mass (BMI = weight in kg/height in m^2).[8] Dyslipidemia: Raised serum cholesterol levels (> 200 mg/dl), raised serum

Triglyceride levels (>150 mg/dl), or both, and reduced serum levels of HDL cholesterol (<40 mg/dl). This study aims to determine the frequency of hypertension and prevalence of factors pertinent to hypertension in stroke patients presenting to the tertiary care hospital of Peshawar, Pakistan. This research will find out the risk factors associated with hypertension in stroke. It will assist us in identifying the groups that are more vulnerable to stroke. It will change our outlook on the disease's early diagnosis and effective management before it manifests as stroke. Furthermore, the study will provide data on the risk factors calculated in our local population and help educate our population about risk factors. Moreover, data will be utilized for future studies and will contribute to world literature from a national perspective.

METHODOLOGY

From October 2020 to March 2021, this descriptive cross-sectional study was conducted at the Khyber Teaching Hospital in Peshawar, Pakistan's Department of Medicine. Ethical approval was taken for this study from KMC/KTH. A non-probability consecutive sampling technique was utilized for this study. A sample size of 225 was estimated using the WHO sample size calculator, with a 6.5% margin of error, a 95% confidence interval, and a 56% hypertension to stroke proportion.[10] Within 72 hours of experiencing stroke symptoms, all patients between the ages of 41 and 80, regardless of gender, met the inclusion criteria for this study. The exclusion criteria were other causes of sudden-onset neurologic symptoms that could mimic strokes, such as epilepsy, dural sinus thrombosis, migraines, head trauma, subarachnoid haemorrhage, subdural hematoma, epidural hematoma, and space-occupying lesions. Patients who present seventy hours after the commencement of stroke symptoms and patients who are less than 41 or more than 80 years old.

RESULTS

The mean age was 61.004 ±6.69 years, with the age range in this study from 41 to 80. The mean duration of elevated blood pressure was 3.052± 0.85 years. Hypertension was seen in 42.2% of patients. Factors having the most significant association with hypertension in stroke patients in descending order are obesity 85.3%, dyslipidemia 71.8%, diabetes mellitus 65.2%, positive family history 61.9%, urban livelihood 42%, old age 40.8% and illiteracy 36.2%. The patient demographics are presented in Table 1.

Table 1: Patient Demographics (n=225)

		Frequency	%age
Age groups (years)	41-60	100	44.4%
	61-80	125	55.6%
Gender	Male	184	81.8%
	Female	41	18.2%
Hypertension	Yes	95	42.2%
	No	130	57.8%

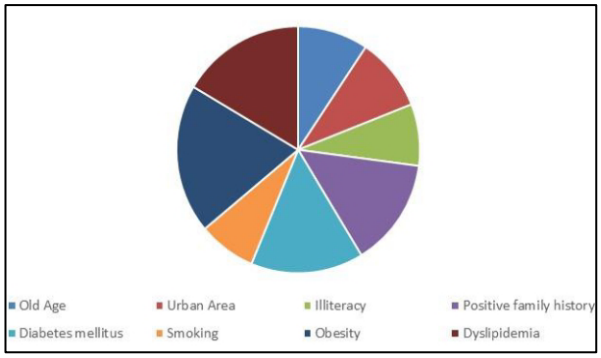

Figure 1: Highlights the Percentage of Factors Leading to Hypertension in Stroke Patients

Table 2: Stratification of Hypertension with Respect to Age, Gender and Duration of Complaint

Age (years)	**Hypertension**		**P-Value**
	Yes	No	
41-60	44(44%)	56(56%)	0.629
61-80	51(40.8%)	74(59.2%)	
Gender	**Hypertension**		**P-Value**
	Yes	No	
Male	75(40.8%)	109(59.2%)	0.347
Female	20(48.8%)	21(51.2%)	
Duratin of Complain (hours)	**Hypertension**		**P-Value**
	Yes	No	
1-36	83(40.5%)	122(59.5%)	0.092
>36	12(60%)	08(40%)	

Table 3: Stratification of Hypertension with Respect to Factors Leading to Hypertension

Factors		**Hypertension**		**Total**	**P-Value**
		Yes	**No**		
Old Age	Yes	51(40.8%)	74(59.2%)	125(100%)	0.629
	No	44(44%)	56(56%)	100(100%)	
Urban Area	Yes	42(42%)	58(58%)	100(100%)	0.952
	No	53(42.4%)	72(57.6%)	125(100%)	
Illiteracy	Yes	29(36.2%)	51(63.8%)	80(100%)	0.178
	No	66(45.5%)	79(54.5%)	145(100%)	
Positive Family History	Yes	52(61.9%)	32(38.1%)	84(100%)	0.000
	No	43(30.5%)	98(69.5%)	141(100%)	
Diabetes Mellitus	Yes	45(65.2%)	24(34.8%)	69(100%)	0.000
	No	50(32.1%)	106(67.9%)	156(100%)	
Smoking	Yes	13(33.3%)	26(66.7%)	39(100%)	0.216
	No	82(44.1%)	104(55.9%)	186(100%)	
Obesity	Yes	64(85.3%)	11(14.7%)	75(100%)	0.000
	No	31(20.7%)	119(79.3%)	150(100%)	
Dys-lipidemia	Yes	56(71.8%)	22(28.2%)	78(100%)	0.000
	No	39(26.5%)	108(73.5%)	147(100%)	

DISCUSSION

In developing and developed nations, cerebral stroke ranks as the third most common cause of death and the leading cause of disability.[11] The incidence increases over thirty years with varying geographical causes. The South Eastern United States stroke belt incidence proves this phenomenon.[12] According to World Health Organization estimates, there is approximately twenty per cent mortality due to stroke in South Asia. According to American Heart Association (AHA) statistical updates, if this rate keeps rising, it could eventually exceed one million yearly.[13] In Pakistan, the annual incidence is increasing by over 250/100,000 due to a lack of large-scale demography in the population. Furthermore, the Pashtun society bears the brunt of this disease because Karachi has the most significant frequency in Pakistan, at almost 4.8%, which is regrettably the highest prevalence ever recorded globally.[15] As reported in the Framingham study, there is poorer post-stroke survival in patients with co-morbid, with nearly 28% death rate 30 days after stroke. About 20% of people in the U.S. after stroke onset die from stroke within a year, with co-morbid conditions increasing mortality.[16] Minimal recovery occurs after the first six months of a stroke episode. Long-term survival is related to the degree of functional impairment. The prognosis deteriorates with an increasing degree of residual disabilities. Bruno et al. reported that mortality increases when thrombolytic therapy is substituted for uncontrolled hyperglycemic patients.[17] Our study data showed the frequency of diabetes mellitus as 65.2%, with most diabetics having poor glycemic control. In diabetic patients, the prevalence of hemorrhagic stroke was significantly outweighed by the ischemic stroke frequency.[18] Demographics of our study showed that nearly 42.2% of the patients suffered from elevated blood pressure, with females taking the lead. The Medical Research Council and Thomson et al. analysis also revealed a notable decrease in stroke in patients with well-managed hypertension.[19] This study of ours depicts the mean age of the patients with stroke as 61.004±6.69 yrs. On the other hand, 26% of patients between the ages of 15 and 45 were documented by Khan JA et al. In Pakistan, co-morbidities like hypertension, diabetes mellitus, smoking, elevated cholesterol levels, and obesity affect the vast majority of stroke patients.[20,21] More than intracerebral bleeding, hypertension was a risk factor for ischemic infarction, but the results did not achieve statistical significance. According to a cross-sectional survey at a tertiary care hospital in Pakistan, 39% of those with hypertension, dyslipidemia, and a history of active smoking were between 18 and 55. This documentation indicates that hypertension is a common cause of stroke in our setup.[21] Only 40% of patients with hypertension had their blood pressure under control. According to the Framingham Heart Study, stroke rates have decreased over 50 years, but lifetime risk has slowly declined.[16] Hyperlipidemia prevailed among 71.8 % of the patients presented with stroke, with an increased association with ischemic stroke patients, but the results were statistically insignificant. Our study's findings are consistent with those of earlier research, so efforts should be made to lower these modifiable risk factors to treat this incapcitating disease.

LIMITATIONS

This was a single centre-based study; hence the results pertain to data collected from one source. A multi-centre study in all provinces of Pakistan will yield better results and further highlight any demographic changes in stroke etiologies.

CONCLUSIONS

Risk factors for stroke include hypertension, diabetes mellitus, hypercholesterolemia, obesity, smoking, and positive family history. Every effort should be made to reduce the manageable risk factors to avoid this potentially fatal disease for effective outcomes. Awareness campaigns and strategies for managing blood pressure, diabetes, and smoking cessation should be prepared and effectively implemented to decrease the risk of stroke and minimize patient morbidity and mortality.

CONFLICT OF INTEREST: None

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