

ORIGINAL ARTICLE

Prevalence of Modifiable Risk Factors among Stroke Patients in Tertiary Care Hospital

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ABSTRACT

Background: A stroke can either be modifiable or non-modifiable triggered by various risk factors. Globally, modifiable stroke could ignite in the form of diabetes, smoking, hypertension, hyperlipidemia, and various heart diseases

Aim: The present study intended to evaluate the prevalence of modifiable risk factors in stroke patients

Methods: This cross-sectional study was conducted on 182 stroke patients admitted to the Medicine Department of TCH name from January 2021 to October 2021. Clinically diagnosed stroke patients of age 20 years or above confirmed by magnetic resonance imaging (MRI) or computed tomography (CT) were enrolled. Demographic details, previous medical history, and concerns investigation were gathered in pre-designed proforma. For data analysis, SPSS version 20 was used

Results: The overall mean age of the 182 stroke patients was 58.43±9.45 years with an age range from 20 years to 85 years. Of the total 182 patients, 104 (57.1%) were male and 78 (42.9%) were female. The male to female ratio was 1.33:1. The prevalence of stroke types such as subarachnoid hemorrhage, cerebral infarction, and intracerebral hemorrhages was 4.5%, 58.4%, and 37.1% respectively. The incidence of risk factors such as ischemic heart disease, previous stroke, high cholesterol levels, smoking history, diabetes, and hypertension was 11 (6.04%), 18 (9.9%), 24 (13.2%), 33 (18.1%), 38 (20.9%), and 113 (62.1%) respectively

Conclusion: Our study found that hypertension is the major modifiable risk factor for stroke development followed by other risk factors such as diabetes, higher cholesterol levels, smoking history, and ischemic heart diseases. Also, it has been observed that stroke prevention is better than cure by identifying various risk factors and initiation of stroke prevention education. Controlling modifiable risk factors mitigate the mortality rate among stroke patients.

Keywords: Ischemic Stroke; Modifiable Risk factors; Hemorrhagic Stroke

INTRODUCTION

Stroke is the world's second leading cause of death which approximately had an 11.13% mortality rate and is also the leading cause of disability [1]. Ischemic stroke is the stroke commonest type causing 87% of stroke cases [2]. A stroke can either be modifiable or non-modifiable triggered by various risk factors. Globally, modifiable stroke could ignite in the form of diabetes, smoking, hypertension, hyperlipidemia, and various heart diseases [3]. The stroke incidence rate in Asia is rising becoming a major challenge in the region. Ischemic stroke is the most common type of stroke and is responsible for long-term disability [4]. A stroke occurs when brain is deprived of oxygen. This could be caused by blood vessel burst or a blood vessel clot blocking. The brain suffers from a lack of oxygen. The long-term effects of a stroke are determined by the area of the brain and the amount of tissue affected [5]. Previous studies acknowledged various non-modifiable risk markers successfully for stroke like age, race, gender, heredity, ethnicity, and stroke numerous modifiable risk factors, over the last several decades [6]. Hypertension, hyperlipidemia, atrial fibrillation, diabetes, cigarette smoking, other cardiac diseases, carotid stenosis, physical inactivity, and transient ischemic attack (TIA) are all possibly improvable stroke risk factors [7].

The mechanism of stroke varies from a young age to old age patients [8]. Arteries, dysplasia, cardio-embolism, atherosclerosis, migrainous arteriopathy, arterio-venous malformations, angiopathy related to pregnancy,

antiphospholipid syndrome, arterio-venous malformations, anemia, arterial dissection, toxic substance consumption, inflammation, head trauma, clotting factors deficiency, and homocysteine level, have been termed in stroke [9]. The strongest modifiable and non-modifiable stroke risk factors are hypertension and age respectively [10]. The stroke likelihood increased with age, diseases coexistence such as diabetes, infarct size increase, and ischemic heart disease-causing poor outcomes [11]. Stroke initial stage (1st month) mortality rate varies from 2.5% in lacunar infarcts patients to space-occupying in fraction hemispheric hemorrhage [12]. Blood pressure control, carotid stenosis surgery, lipid-lowering agents, antiplatelet agents, and atrial fibrillation warfarin can all reduce the risk of a stroke [13]. Limited research has been done on modifiable risk factors incidence rate determination among stroke patients in Pakistan, therefore, the current study aim was to assess the prevalence of modifiable risk factors among stroke patients.

MATERIALS AND METHODS

This cross-sectional study was conducted on 182 stroke patients admitted to the Medicine Department of TCH name from January 2021 to October 2021. Clinically diagnosed stroke patients of age 20 years or above confirmed by magnetic resonance imaging (MRI) or computed tomography (CT) were enrolled. Demographic details, previous medical history, and concerns investigation were gathered in pre-designed proforma. Prior

to the study conducting, Hospital Ethics Committee gave its approval. All patients underwent brain CT scans or MRI scans. All the patients having pathologies such as multiple sclerosis, metabolic derangements, brain abscess, hypoglycemia, brain tumors, subdural/extradural hematoma, viral or bacterial encephalitis, and meningitis were excluded. The comprehensive medical history, type of stroke, previous medical complications, stroke risk factors, and radiological investigations, and laboratory findings were reported. SPSS version 20 used for data analysis.

The modifiable risk factors were defined as per the world health organization as follows; Hypertension: Previously identified patients BP (twice) evaluations of >140/90mmHg). Anomalous Cholesterol Advancement: Records of abnormal cholesterol elevation (>200mg/dL) Smoker: Someone who had smoked single time/day for the previous 3months or had any form of tobacco in their possession. Diabetes mellitus: Already detected elevation of sustained blood sugar >110mg/dL. Ischemic Heart Diseases: Ischemic heart disease, congestive cardiac failure, cardiac arrhythmia, infective endocarditis, or that existed in the past or was diagnosed during hospitalization.

RESULTS

The overall mean age of the 182stroke patients was 58.43±9.45 years with an age range from 20 years to 85years. Of the total 182 patients, 104 (57.1%) were male and 78 (42.9%) were female. The male to female ratio was 1.33:1. The prevalence of stroke types such as subarachnoid hemorrhage, cerebral infraction, and intracerebral hemorrhages was 4.5%, 58.4%, and 37.1% respectively. The incidence of risk factors such as ischemic heart disease, previous stroke, high cholesterol levels, smoking history, diabetes, and hypertension was 11 (6.04%), 18 (9.9%), 24 (13.2%), 33 (18.1%), 38 (20.9%), and 113 (62.1%) respectively. Descriptive statistics of patients' age are shown in Table-1. The prevalence of males and females is shown in Figure-1. The prevalence of

stroke risk factors is illustrated in Figure-2. Table-2 illustrates the risk factors distribution with respect to gender. The prevalence of risk factors according to the types of stroke is shown in Table 3.

Table-1 Descriptive statistics of 182 patients

Parameters	Values
Total Patients	182
Mean age (years)	58.43
Standard deviation	9.45
Median	58
Minimum Age	20
Maximum Age	85

Table-2 Risk factors with respect to gender distribution (n=182)

Risk Factors	Male n (%)	Female n (%)	Total n (%)
Total Patients	104 (57.1)	78 (42.9)	182 (100)
Hypertension	63 (60.6)	41 (52.6)	104 (62.1)
Diabetes	21 (20.2)	17 (21.8)	38 (20.9)
Smoking History	29 (27.9)	4 (5.1)	33 (18.1)
High Cholesterol level	15 (14.4)	9 (11.5)	24 (13.2)
Previous Stroke	9 (8.7)	9 (11.5)	18 (9.9)
Ischemic Heart Disease	5 (4.8)	6 (7.7)	11 (6.04)

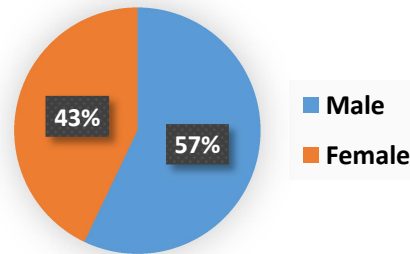


Figure-1 Gender distribution (n=182)

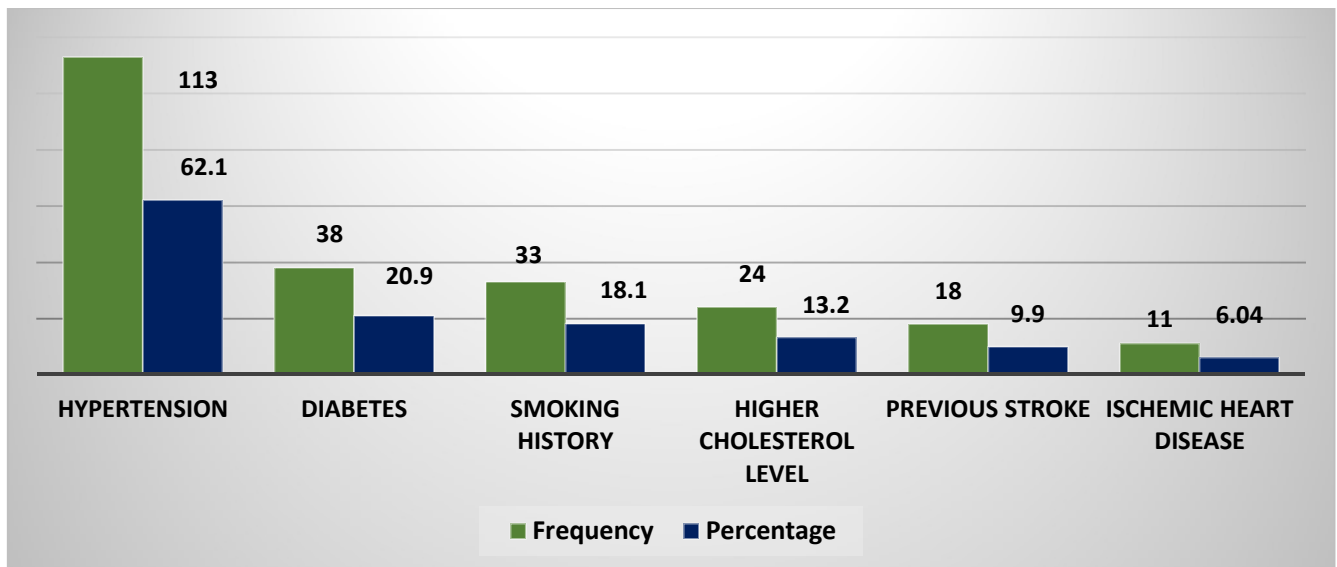


Figure-2 Prevalence of modifiable risk factors (n=182)

Table-3 the prevalence of risk factors according to the types of stroke

Risk Factors	Subarachnoid hemorrhage n (%)	Cerebral Infraction n (%)	Intracerebral hemorrhages n (%)
Total Patients	8 (4.5%)	106 (58.4%)	68 (37.1%)
Hypertension	3 (37.5)	75 (57.7)	38 (56.3)
Diabetes	2 (25)	22 (21.8)	15 (21.9)
Smoking History	2 (25)	17 (16.2)	15 (21.9)
High Cholesterol level	1 (10)	19 (17.6)	7 (10.9)
Previous Stroke	0 (0)	5 (4.4)	12 (17.2)
Ischemic Heart Disease	0 (0)	6 (5.9)	5 (7.8)

DISCUSSION

Stroke is a clinically characterized syndrome with focal signs and rapid symptoms development causing cerebral function loss within 24 hours and causing mortality with vascular origin as an apparent cause. Despite new strategies for post-stroke management, stroke continues to be a severe disease that affects both the patient and his family. Identifying and modifying risk factors remains the imperative means for incidence reduction of stroke. Age is obviously the most important factor of new cases of stroke [14]. In our study, the overall mean age of the patients was 58.43±9.45 years which was comparable to another study conducted in the same region [15]. Cinza-Sanjurjo et al. reported that stroke patients on an average basis had 55 years of age at the time of presentation. Age is the prominent factor of stroke and our study mean age was lower than reported in Western studies of 76-80 years [16, 17]. Males outnumbered females in our study, with a male frequency of 54.1% and a female frequency of 42.9%. Males outnumbered females (68%) in a study piloted by Von Sarnowski et al [18]. Similar findings were reported in one more study performed by al Kobayashi et al [19], which revealed that males outnumbered females in stroke of all kinds.

In the current study, 37.1% of patients had a cerebral infarction, 58.4% had a cerebral haemorrhage, and 4.5% had a subarachnoid haemorrhage. Some local studies reported that the cerebral infarction proportion ranged from 55-70.1% and Western studies found 60% to 84% [20], whereas most local, eastern, and South Asian studies proposed that intracerebral haemorrhage ranged from 21% to 45%, compared to 10% to 20% in the West [21]. Our findings were similar to those of Asian and other countries. Regardless of geographic region, HTN is the substantial modifiable risk factor for hemorrhagic and ischemic stroke. People with HTN are four times more susceptible to stroke. Controlling hypertension can reduce the risk of stroke by at least 38%. Stroke risk is primarily determined by the blood pressure quality, as demonstrated by United Kingdom and the Netherlands based previous studies [22, 23]. The prevalence of hypertension was 62.1%.

Diabetes mellitus was found in 20.9% of our patients, with males being slightly more prevalent than females. Our findings were comparable to those of other studies, despite

the fact that other studies revealed a high prevalence of diabetes mellitus. According to Jorgensen et al [24], diabetes mellitus affects 20% of the population. Diabetes mellitus increases the risk of ischemic stroke by more than threefold in patients, according to our findings. Diabetes was found to be self-determining ischemic stroke predictor in both men and women. Naess et al [25] reported that 76% patients had ischemic strokes, with lacunar infarcts accounting for one-third of them. The majority of hemorrhagic strokes were intracerebral hemorrhages (ICHs), with subarachnoid hemorrhages accounting for only 2% of all strokes (SAHs). The most common risk factors were hypertension (52%), diabetes (41%), and cardiac disorders. Another study found that ischemic strokes accounted for 76.2% of all strokes, with 52% having large infarctions and lacunar infarctions 24.2%. About 21.4% cases had intracerebral hemorrhage, while 2.4% subarachnoid hemorrhage was uncommon.

Haheim LL et al [26] discovered that a stroke can be better predicted with diastolic blood pressure rather than systolic blood pressure. Mortality of stroke can be with incidence of tobacco used. Total serum cholesterol was found to be a significantly stroke mortality risk factor for stroke incidence, whereas limited studies revealed a smoking pattern that was somewhat similar to that of the West [27] The prevalence of IHD was 6.3%, whereas a much higher prevalence 35%-72% in Western studies [27].

CONCLUSION

Our study found that hypertension is the major modifiable risk factor for stroke development followed by other risk factors such as diabetes, higher cholesterol levels, smoking history, and ischemic heart diseases. Also, it has been observed that stroke prevention is better than cure by identifying various risk factors and initiation of stroke prevention education. Controlling modifiable risk factors mitigate the mortality rate among stroke patients.

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