



ISCHEMIC STROKE; FREQUENCY OF DYSLIPIDEMIA AND OTHER RISK FACTORS AT TERTIARY CARE HOSPITAL HYDERABAD/ JAMSHORO

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ABSTRACT... Objectives: To determine the frequency of Dyslipidemia and other risk factors in patients with ischemic stroke. **Study design:** Descriptive and case series. **Setting:** This research study was carried out in the Medicine department of Liaquat University Hospital Jamshoro/Hyderabad. **Duration of study:** Six months. **Sample size:** Total 100 patients of both male and female sex were enrolled in this research study. **Results:** Total 100 cases of ischemic stroke were included. The mean age \pm SD (range) was 59.72 ± 6.40 (45 – 70 years), 76(76.0%) were males and 24(24.0%) were females. Speech deficits was present in 28(28.0%, n = 100) patients. Eighty seven (87.0%, n = 100) patients had difficulty in walking, 17(17.0%, n = 100) patients had seizures, confusion was observed in 35(35.0%, n = 100) patients, 35(35.0%, n = 100) had headache, Vertigo was seen in 11(11.0% n = 100) patients, Visual disturbances was seen in 14(14.0%, n = 100) cases and 20(20.0% n = 100) patients had vomiting. High blood pressure was in 51(51.0%, n = 100), diabetes mellitus and dyslipidemia in 30(30.0%, n = 100) respectively. Eighteen (18.0%, n = 100) patients were known cases of cardiovascular diseases, 36(36.0%, n = 100) were smokers, 22(22.0%, n = 100) patients had family history of stroke and only 2(2.0%, n = 100) patients had the history of alcoholism. High cholesterol (mg/dL) was seen in 21(21.0% n = 30) patients, High LDL (mg/dL) in 37(37.0%, n = 30), Low HDL (mg/dL) in 90(90.0%, n = 30) and High Triglycerides (mg/dL) were seen in 40(40.0%, n = 30). **Conclusion:** High Blood pressure, Diabetes mellitus, Dyslipidemia and Smoking are chief risk elements of ischemic stroke. Prevalence of stroke is high in poor socioeconomic demographics with single or multiple risk elements and this may be because of unawareness about these risk elements, unaffordability of treatment or proper follow up.

Key words: Ischemic stroke, dyslipidemia, high blood pressure, diabetes mellitus, stroke risks.

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INTRODUCTION

Stroke is defined as abrupt loss of blood flow to a part of the brain that leads to functional neurological deficit. Ischemic stroke accounts for up to 85% of all strokes.¹ Stroke is one of the important factor of morbidity and death worldwide. In industrialized nations, stroke is the third most frequent cause of demises.²

In developing nations, incidence of ischemic stroke has varied from 101 to 264 per 100,000 during the last two decades, with trends declining over time.³

Each year five million people are killed by stroke.⁴Stroke is more common in men than in

ladies.⁵ The mean age of patients with stroke differs from 52 to 56 years in several research studies and male to female ratio is 1:5.^{6,7} According to world health organization estimates, 5.5 million people died of stroke in 2002, and roughly 20% of these demises occurred in South Asia.⁸ Contrary to decline in the incidence of malady in South Asian nations has inclined and is expected to rise.⁹ Stroke related demises and disabilities are reaching epidemic proportions in developing countries.¹⁰ To diminish the incidence of stroke, it is essential to recognize and modify the risk elements for stroke. Common modifiable risk factors are High blood pressure, Diabetes Mellitus, Dyslipidemia Cigarette Smoking, cardiac Valvular disease and Alcoholism. Age,

gender, and heredity have been recognized as non-modifiable risk elements for stroke.⁴

Atherosclerosis and thrombosis are main pathological processes underlying coronary artery disease and ischemic stroke.¹¹ High cholesterol level is connected with an expanded danger of ischemic stroke¹ The Asian Pacific cohort studies collaboration demonstrated that 25% increase in ischemic stroke rates for every 38.67 mg/dl increase in total cholesterol.¹² Elevated total cholesterol and low density lipoprotein cholesterol as well as low level of high density lipoprotein are possible risk elements for ischemic stroke.¹² It is still questionable whether the lipid profile assumes an important etiological part in ischemic stroke.¹⁴ Though, aggregating proof has indicated pathophysiological processes such as atherosclerosis, endothelial dysfunction and prothrombotic state which could contribute to ischemic stroke danger.¹³ The reported prevalence of dyslipidemia in stroke was 33% by Khan et al.¹⁵

This study was intended to evaluate and assess the dyslipidemia and other risk elements for ischemic stroke at Liaquat University Hospital Hyderabad/ Jamshoro. The motivation beyond this research study was to determine the frequency of dyslipidemia and other risk agents in ischemic stroke patients. Early identification and correction of dyslipidemia and some other modifiable risk agents can prevent the patients to develop permanent neurological damage by ischemic stroke.

MATERIAL AND METHODS

Setting

This study was carried out in the Department Of Medicine Liaquat University Hospital Jamshoro/ Hyderabad.

DURATION OF STUDY

Six months.

STUDY DESIGN

Descriptive case series

SAMPLE SIZE

100 Patients of ischemic Stroke

SAMPLING TECHNIQUE

Non Probability (Purposive)

SAMPLE SELECTION

Inclusion criteria

- Patients with clinical and radiographic diagnosis of ischemic Stroke.
- All patients should be ≥ 18 years of age.
- Of either gender

Exclusion Criteria

- Patients with clinical and radiological diagnosis of Hemorrhagic Stroke and other neurological disorders like intracranial tumours, encephalitis tuberculous meningitis, and multiple sclerosis.
 - Patient taking cholesterol lowering drugs.
 - Patient addicted to alcohol

DATA COLLECTION PROCEDURE

Patients with cerebrovascular accident who came through outdoor patient department (OPD) or casualty outdoor department (COD) were evaluated and those patients who were meet the inclusion and exclusion criteria were enrolled in this study. An informed consent was taken taken from every conscious patient and attendants from unconscious patient after full explanation of research work. On admission, detailed history and thorough clinical examination including neurological assessment were carried-out. Special importance was given to risk elements especially hyperlipidemia, however other related parameters were evaluated including diabetes mellitus, high blood pressure, smoking, atrial fibrillation etc. The clinical diagnosis of ischemic stroke was made on the basis of neurological history and clinical signs. All patients had Computed Tomography scan of brain. The results of Tomographic scan scan were matched with clinical diagnosis on case to case basis and precision of clinical diagnosis were ascertain. After fulfilling the management protocol the 3 cc sample of venous blood in a disposable syringe were taken after 12 hour fasting and sent for

analysis of fasting lipid profile. The data of the patients was collected on pre-designed proforma.

statistical analysis

The data was entered and analyzed using statistical program SPSS version 16.0 Simple frequencies and percentage of dyslipidemia in ischemic stroke, signs and symptoms, gender was presented as n (%) while the quantitative variables such as age, serum cholesterol, low density lipoprotein LDL, high density lipoprotein HDL, very low density lipoprotein VLDL, duration frequency and severity of the stroke were presented as Mean + Standard Deviation. No statistical test was applied for any comparison.

RESULTS

Total 100 cases of ischemic stroke were included in the study based on inclusion and avoidance criteria. The mean age + SD (range) was 59.72 + 6.40 (45 – 70 years). Out of 100 cases, 76(76.0%) were males and 24(24.0%) were ladies.

Sixty eight (60.0%, n = 100) patients had right hemiplegia and right hemiparesis (8%, n = 100), (26.0%, n = 100) had left hemiplegia and left hemiparesis (6%, n = 100).

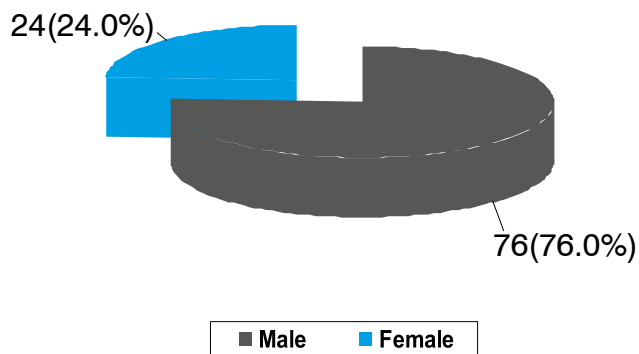
Right side of lesion for ischemic stroke was present in 32(32.0%, n = 100), Left side of lesion for ischemic stroke was seen in 68(68.0%, n = 100) cases.

In this research study, 35 (35%, n = 100%) patients were unconscious and 25, (25%, n = 100) speech deficits was present in 28(28.0%, n = 100) patients. Eighty seven (87.0%, n = 100) patients had difficulty in walking, 17(17.0%, n = 100) patients had seizures, confusion was observed in 35(35.0%, n = 100) patients, 35(35.0%, n = 100) had headache, Vertigo was seen in 11(11.0% n = 100) patients, Visual disturbances was seen in 14(14.0%, n = 100) cases and 20(20.0% n = 100) patients had vomiting.

In the present study, the frequency of high blood pressure was 51(51.0%, n = 100), diabetes mellitus and dyslipidemia in 30(30.0%, n = 100)

respectively. Eighteen (18.0%, n = 100) patients were known case of cardiovascular diseases, 36(36.0%, n = 100) were smokers, 22(22.0%, n = 100) patients had family history of stroke and only 2(2.0%, n = 100) patients had the history of alcoholism.

In this study, High cholesterol (mg/dL) was seen in 21(21.0% n = 30) patients, High LDL (mg/dL) in 37(37.0%, n = 30), Low HDL (mg/dL) in 90(90.0%, n = 30) and High Triglycerides (mg/dL) were seen in 40(40.0%, n = 30).



Gender Distribution of Ischemic Stroke Patients (N = 100)

DISCUSSION

Stroke is main cause of illness and mortality across the globe and a 3rd chief cause of mortality in the developed world.^{16,17} More than 50% of all neurological hospital admissions in adult wards are because of stroke¹⁸, it is a main cause of adult disability and poses excessive burden over the health care and social services accounting for about 6% of social services expenditure in United Kingdom.^{19,20}

The incidence of stroke in United Kingdom is 240/100,000 per year. This increases with age and is higher in males than in females.²¹ Stroke is probably as common in Pakistan and is responsible for significant mortality, morbidity and financial constraints.

In Chinese and Australian research studies risk of stroke was higher in high blood pressure patients as compared to normotensive patients.²²

Parameter	Frequency	Percentage
Right hemiplegia	68	68.0%
Left hemiplegia	32	32.0%
Right Ischemic stroke	32	32.0%
Left Ischemic stroke	68	68.0%
Signs and symptoms:		
Speech deficits	28	28.0%
Difficulty in walking	87	87.0%
Seizure	17	17.0%
Confusion	35	35.0%
Headache	35	35.0%
Vertigo	11	11.0%
Visual disturbances	14	14.0%
Vomiting	20	20.0%
Risk Elements:		
High blood pressure	51	51.0%
Diabetes mellitus	30	30.0%
Dyslipidemia	30	30.0%
Cardiovascular diseases	18	18.0%
Smoking	36	36.0%
Alcoholism	02	02.0%
Family History	22	22.0%

Baseline Characteristics Of The Patients

Lipid Profile	Mean \pm SD	Frequency	Percentage
Cholesterol (mg/dL)	166.5 \pm 33.3	21	21.0%
LDL (mg/dL)	128.3 \pm 8.56	37	37.0%
HDL (mg/dL)	32.77 \pm 1.57	90	90.0%
Triglycerides (mg/dL)	147.6 \pm 27.5	40	40.0%

Dyslipidemia in the patients of Ischemic stroke (n=30)

Cerebral atherosclerosis with atheroma formation is essential hidden underlying pathophysiologic component in ischemic stroke. High blood pressure is one chief danger element for atherosclerosis.²²

The risk of ischemic stroke increases with age²³ and the mean age in our study was 59.58 years which was similar to the local research study of Barech MS et al.¹ he demonstrated 61.0 years and in the other local study of Sacco RL et al.²⁴ conducted in Dera Ismail Khan, he observed 63.42 years. these outcomes correlate well to this study.

In this series, 76% (n = 100) were males and 24(n = 100) were females while Kamal A et al.²⁵ reported the same figure whereas in an other

study conducted in JPMC Karachi by Khan NI et al.²⁶ who showed similar results i.e. 78% males and 22% females in his research study.

High blood pressure is a chief risk element for coronary artery disease and ischemic stroke and is related with foremost health risk factors such as diabetes and high cholesterol level.^{27,28} In this research study, hypertension was observed as a major risk factor i.e. 51% (n = 100) in ischemic stroke. High blood pressure was also found as major and vital risk factor in ischemic stroke in the study of Atif MA et al.²⁹ who revealed 72% high blood pressure in his research study. Kamal A et al.²⁵ also reported that high blood pressure was major and important risk element in his research study.

Numan A et al, Zaidi K et al, Ansari AK et al and many others have additionally demonstrated the similar high incidence of high blood pressure in our populace.^{30,31,32} The reason behind this may be the sedentary life style along with inadequate and imbalanced diet. Baena Diez et al and Intiso D et al, in their studies carried out in the west have demonstrated the same frequency of these danger factors^{33,34}.

Regrettably high blood pressure is the silent disease either diagnosed incidentally or when complicated such as stroke developed. This hard reality is not observed only in our setup but also in developed nations.

This study, confirmed the observations of research studies performed in past in our beloved country that high blood pressure is the leading danger element of ischemic stroke. Therefore it is mandatory to distinguish and treat high blood pressure at its starting.

Diabetes was found the second most frequent element in this research study. This is in accord to the finding published in Pakistan and from elsewhere.¹ It was present in 30.0% of cases in present study which is somewhat lower than other research studies in our beloved country. Khan NI et al²⁶ showed 36% of diabetes with stroke, Hamzullah and Zarif demonstrated 30% which is similar to this study. The frequency of diabetes among stroke patients in other industrialized countries differs from 7% to 41%.^{35,36,37,38}

In this research study, dyslipidemia was present in 30% patients, which is greater than 11-23% reported in other studies from our beloved country.³⁹ While Khan NI et al.²⁶ indicated that 32% frequency of dyslipidemia which correlated well to this study. Higher prevalence of dyslipidemia in our stroke populace could be because of smoking and underlying diabetes. The frequency of high cholesterol level in the present study was seen in 21% (n = 30) patients. This observation is similar to the study of Almani SA et al.⁴⁰ who revealed the 19% frequency of hypercholestermia in his study. Ali L⁴¹ also showed the similar results.

Smoking increases stroke risk by producing acute effects on the risk of thrombus formation in narrowed arteries and chronic effects related to an increased burden of atherosclerosis.⁴² The estimated risk for ischemic stroke among smokers in this study patients was 36%, and was an independent risk element among males (44.7%, n = 36) whereas Almani SA⁴⁰ reported low frequency of smokers i.e. 19% in his study. Other study of Kamal A et al²⁵ also reported the low frequency of smokers in his research study. The difference is because of lack of awareness, absence of education, poor financial status in our populace from rural areas while local studies revealed somewhat similar pattern of smoking as those in the west.^{43,44}

In stroke patients cardiovascular illnesses are frequent. It increases the estimated danger of stroke by 2 to 4 times.⁴⁶ The frequency of Ischemic heart disease found in our populace was 18%. Almani SA et al.⁴⁰ and Kamal A et al.²⁵ demonstrated the 16% frequency of Ischemic cardiac disease respectively which is comparable to this study while Western series had much higher frequency (35% to 72%).^{43,44} It was additionally noticed that ischemic heart disease is an independent indicator of ischemic stroke.

CONCLUSION

The outcomes of this study infers that dyslipidemia, diabetes, high blood pressure, smoking are vital risk elements of ischemic stroke

Prevalence of stroke is high and this might be because of unawareness related with these risk elements, unaffordability of medications or proper follow up.

By early and rapid recognition and control of modifiable risk components we can decrease the illness and death of stroke related patients, which will decrease the financial load on our populace and across the globe.

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