# TO DETERMINE THE HYPERLIPIDEMIA FREQUENCY IN PATIENTS OF ISCHEMIC STROKE

[1]Dr Aftab Rabbani, [2]Dr Sameera Wajahat Rabbani, [3]Dr Omer Masood

[1]MBBS MRCP, Associate Professor, Sharif Medical and Dental College Lahore, [2]Resident Medical Officer at Shaukat Khanum Memorial Cancer Hospital Lahore, [3]MBBS, Demonstrator, Department of Community Medicine, Sahara Medical College Narowal.

**Abstract:**
*Objective:* To estimate the hyperlipidemia frequency in patients of ischemic stroke.
*Study design:* A cross-sectional study.
*Place and Duration:* In the Medicine Unit II of Mayo Hospital Lahore for Six months duration from January 2019 to June 2019.
*Methods:* One hundred and seventy-eight patients who met the inclusion criteria were selected through the Emergency Department after identification of stroke clinical features, including sudden dizziness, double vision or abnormal eye movement, eye weakness. It affects leg or arm or sensation loss due to pain and touch to the affected side confirmed on CT. Fasting lipid profile [serum triglycerides, LDL, VLDL and HDL], blood sugar levels, fasting lipid profile and levels of serum homocysteine were checked in all patients. Their results were recorded in the proforma.
*Results:* The incidence of hyperlipidemia in our study was 37.1%. The prevalence of diabetes mellitus was 9.6% and hypertension was 10.1%.
*Conclusion:* The incidence of hyperlipidemia was 37.1% in patients with ischemic stroke.
**Keywords:** *Ischemic stroke, hyperlipidemia, serum cholesterol, serum triglycerides.*

**Corresponding author:**
**Dr Aftab Rabbani**
*MBBS MRCP, Associate Professor,*
*Sharif Medical and Dental College Lahore.*

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## INTRODUCTION:

Stroke (CVA) is a clinical pattern determined by the rapid development of symptoms and / or focal signs due to cerebral dysfunction in patients resulting in coma enduring above 24 hours or result in death without obvious reason other than of vascular derivation. Conferring to the 2002 report of the World Health Organization (WHO), the total death due to stroke in Pakistan was 78512 [1-3]. WHO estimates that in 2020 the 2nd major cause of death will be stroke after ischemic heart disease in developed and under developed countries. An epidemiological study of a stroke in Taiwan showed that the average annual incidence of the first stroke in the 36-44 age group was 26 per 100,000. Globally, 15 million people are paralyzed every year [4]. Five million of them die and five million are disabled permanently, which is encumbrance for society [5]. The stroke is the result of cerebral circulation change which is seen clinically due to a major blood vessel blockage or a blood vessel rupture due to thromboembolism. Approximately most of the strokes are of ischemic origin in 85% of cases resulting from cerebral artery embolic or thrombotic occlusion. Numerous risk aspects are related with stroke. [6] Irreversible risk factors; age, gender, race, family history and ethnicity, and adjustable risk factors; heart disease, HTN, hyperlipidemia, DM, alcohol abuse, carotid stenosis, smoking, TIA and physical inactivity. Stroke is rare in people under the age of 40, when it occurs, the main cause is high blood pressure [7]. For stroke; the major causes are diabetes mellitus (32.5%) 9, raised blood pressure (35%) 8, hyperlipidemia (35%) 8, obesity (18%) 10, tobacco (37%) 8 and consumption of alcohol (22.5%) 9, heart disease (14%) 8 i.e. Arterial fibrillation and coronary artery disease, homocysteinuria, migraine with aura, history of stroke, abuse of recreational drugs, history of stroke family and oral contraceptive pills are also important stroke risk factors [8]. Hyperlipidemia has been recognized as a significant risk aspect for ischemic stroke. There are already data on the determinants of stroke risk in Pakistan in various parts of the country. Various risk factors contribution to stroke may be altered in different ethnic backgrounds [9]. Subsequently stroke is often paralyzing and the treatment effects on prognosis is low, the potential for controlling the disease lies in primary prevention [10]. Since hyperlipidemia is an important cause of stroke, this study will help to treat such patients from time to time and to develop guidelines to prevent hyperlipidemia, a major cause of stroke.

## MATERIALS AND METHODS:

This cross-sectional study was conducted at the Medicine Unit II of Mayo Hospital Lahore for Six months duration from January 2019 to June 2019. One hundred and seventy-eight patients who met the inclusion criteria were selected through the Emergency Department after identification of stroke clinical features, including sudden dizziness, abnormalities in double vision or eye movement, and affected weakness. Leg or arm or sensory loss due to pain and contact on the affected side confirmed on CT. Informed consent was obtained from patients / assistants who defined working procedures to ensure confidentiality and the fact that there was no risk to the patient when participating in this study. Consent of the Ethics Committee of the Institution has also been obtained. Fasting lipid profile serum triglycerides, LDL, VLDL and HDL, blood sugar levels, fasting lipid profile and levels were present in all patients. Serum homocysteine. Blood samples were taken from the central laboratory of Nishtar Multan hospital. All information was recorded on a form specifically designed by the researcher, including the outcome variable, namely hyperlipidemia (Yes, No). Data were entered and analyzed using SPSS version 18.0 software. To calculate standard deviation and mean descriptive statistics were applied for age, triglyceride level, serum cholesterol, LDL and HDL levels. Frequency and percentages for gender and hyperlipidemia were calculated. Aging modifiers such as age, sex, diabetes mellitus and hypertension were controlled by stratification.

## RESULTS:

This study was performed in 178 patients with ischemic stroke. The age of admission for stroke patients was higher between 60 and 79 years, ie 73 (41.0%) followed by 40 (35.4%) patients 40 and over. There were 25 (14%) patients aged 59 to 20 years and 17 (9.6%) patients aged 80 years and older (Table 1).

Table 1: Age distribution of patients presenting with ischemic stroke (n=178)

| Age (in years) | =n | %age |
|---|---|---|
| 20 — 39 | 25 | 14.0 |
| 40 — 59 | 63 | 35.4 |
| 60 — 79 | 73 | 41.0 |
| 80 and above | 17 | 9.6 |

The age range of patients was 20 to 100 years. The mean age at presentation was 55.96 ± 15.76 years, as indicated in Table 5. There were 86 (48%) males and 92 (52%) females (Figure 1).

Fig. 1: Gender distribution of patients presenting with ischemic stroke (n=178)
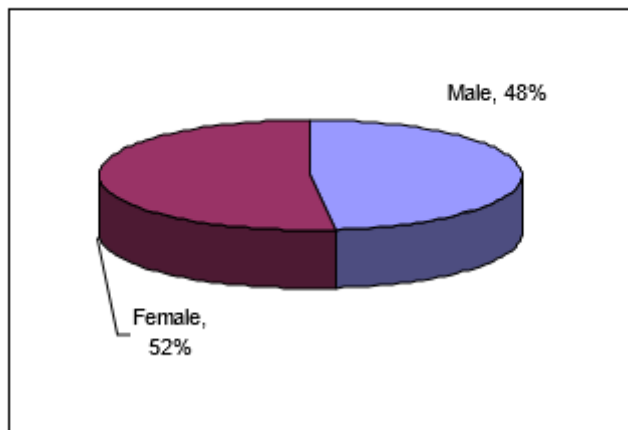


The frequency of hyperlipidemia in our study was 37.1% as indicated in Table 2.

Table 2: Frequency of Hyperlipidemia in patients presenting with Ischemic stroke (n=178)

| Hyperlipidemia | =n | %age |
|---|---|---|
| Yes | 66 | 37.1 |
| No | 112 | 62.9 |

The prevalence of diabetes mellitus was 9.6% (Table 3) and hypertension was 10.1% (Table 4).

Table 3: Frequency of diabetes mellitus in patients presenting with ischemic stroke (n=178)

| Diabetes | =n | %age |
|---|---|---|
| Yes | 17 | 9.6 |
| No | 161 | 90.4 |

Table 4: Frequency of hypertension in patients presenting with ischemic stroke (n=178)

| Hypertension | =n | %age |
|---|---|---|
| Yes | 18 | 10.1 |
| No | 160 | 89.9 |

Descriptive statistics indicate that mean cholesterol is 201.14 ± 44.87 (mg / dl), mean serum triglyceride is 159.20 ± 27.10 (mg / dl), low density serum lipoprotein is 98.65 ± 33.65 (mg / dl) and high density lipoprotein 65.36 ± 15.87 (mg / dl) as shown in Table 5.

Table 5 (Descriptive Statistics)

| Variable | Mean±S.D. |
|---|---|
| Age (in years) | 55.96±15.76 |
| Serum cholesterol (mg/dl) | 201.14±44.87 |
| Serum triglyceride (mg/dl) | 159.20±27.10 |
| Serum low density lipoprotein (mg/dl) | 98.65±33.65 |
| High density lipoprotein (mg/dl) | 65.36±15.87 |

Of the 25 patients aged 20 to 39 years, 2 (8%) had hyperlipidemia of 63 patients aged 40 to 59 years, 26 (41.3%) had hyperlipidemia, 31 (42.5%) of 73 patients aged 60 to 79 years. hyperlipidemia, hyperlipidemia was present in 7 (41.2%) of 17 patients aged 80 years or older (Table 6).

Table 6: Age distribution of ischemic stroke patients in relation to outcome

| Age (years) | Ischemic stroke patients | Patients with Hyperlipidemia | %age |
|---|---|---|---|
| 20-39 | 25 | 2 | 8.0 |
| 40-59 | 63 | 26 | 41.3 |
| 60-79 | 73 | 31 | 42.5 |
| 80 and above | 17 | 7 | 41.2 |

Of the 86 men with ischemic stroke, 29 (33.7%) had hyperlipidemia and 37 (40.2%) of 92 women with ischemic stroke had hyperlipidemia (Table 7).

Table 7: Gender distribution of ischemic stroke patients in relation to outcome

| Sex | Ischemic stroke patients | Patients with Hyperlipidemia | %age |
|---|---|---|---|
| Male | 86 | 29 | 33.7 |
| Female | 92 | 37 | 40.2 |

### DISCUSSION:

Stroke is one of the main reasons for functional impairment that requires institutional care in 20% after 3 months and between 15 and 30% in permanent disability needs institutional care. Stroke is a life-changing event that affects not only the disabled but also the whole family and other caregivers. The World Health Organization estimates that in 2002, 5.5 million people died of paralysis in South Asia, accounting for about 20% of these deaths [11]. In addition, contrary to the decrease in the incidence of the disease in the western population, the burden of the disease in South Asia (India, Pakistan, Bangladesh and Sri Lanka) is expected to increase [12]. Data on modifiable risk factors for stroke in developed world populations show an alarmingly high prevalence in the Pakistani population. Hypertension, the most preventable cause of individual stroke, affects one in three adults over the age of 45 and 19% of the population aged 15 and over. Hyperlipidemia has been reported as 16% in the normal population and 68% in the obese population. The Pakistan National Health Survey showed that 35% of those under 45 years of age had diabetes mellitus. Coronary artery disease can cause cardioembolic paralysis and replace atherosclerosis in the cerebrovascular system: a population-based cross-sectional study showed that 1 in 4 middle-aged adults, male and female, are at the same risk [13]. The prevalence of general obesity is 28% in women and 22% in men. The prevalence of tobacco use is 40% for men and 12% for women. This study was designed to investigate the incidence of hyperlipidemia among other risk factors in patients with ischemic stroke. The mean presentation age of the ischemic stroke was 55.96 ± 15.76 years. There were 86 (48%) males and 92 (52%) females. The incidence of hyperlipidemia in our study was 37.1%. Other risk factors were 10.1%, high blood pressure and 9.6% diabetes. These results can be compared with the existing literature. Asghar Kamal and colleagues investigated risk factors for stroke. The mean age of the patients was 63.42 years. The main risk factors were hypertension (60%), diabetes mellitus (20%), hyperlipidemia (18%), smoking (16%) and cardiovascular disease (16%) [14]. Hamzullah Khan and Associates evaluated risk factors for stroke and found arterial hypertension 46.2%, diabetes 15.4%, ischemic heart disease 12.1%, smoking 5.5% and hyperlipidemia 3.3%. Niaz Ahmed Shaikh et al found a 19.65% incidence of hyperlipidemia in patients with ischemic stroke in a study in Karachi. In a recent study, Kemal et al. Risk factors for ischemic stroke were evaluated in young patients (18 to 47 years). Hypertension was the main risk factor (45%) followed by smoking (37%), hyperlipidemia (35.4%), diabetes mellitus (17%) and family history of stroke (18%). Hypertension, diabetes mellitus, hypercholesterolemia and smoking were present alone or in combination in most patients [15]. Dyslipidemia was present in 32% of patients with ischemic stroke and 10 were greater than 11-23% in another study in Pakistan. The relationship between total cholesterol and ischemic stroke risk has been investigated in some previous observational studies that increase the risk of elevating certain cholesterol levels and increase the risk of absence of certain open relationships.

### CONCLUSION:

A high hyperlipidemia (37.1%) prevalence is alarming in our configuration and requires medical intervention for modifiable risk factors.

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