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Research Article

### INCIDENCE OF ISCHEMIC AND HEMORRHAGIC STROKE AND COMPARISON OF LEVELS OF LOW-DENSITY LIPOPROTEIN AMONG THESE PATIENTS

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**Abstract:**

**Aim:** Determination of the incidence of ischemic or hemorrhagic stroke and comparison of average LDL levels in ischemic and hemorrhagic stroke.

**Place and Duration:** In the Medicine Unit II department of Nishtar Hospital Multan for one-year duration from March 2019 to March 2020.

**Methods:** 310 patients between 20 and 70 years of age from both age groups were selected for this study. Computed tomography of the brain of all patients was reviewed to determine the type of ischemic or hemorrhagic stroke. A Venus sample for LDL levels was scheduled according to protocol after 8 hours of fasting overnight within 24 hours of admission. All relevant information, including LDL levels and confidence variables such as diabetes, fasting blood sugar > 110 and hypertension, systolic blood pressure > 140, diastolic blood pressure > 90, are specifically indicated for this purpose in form. Mean LDL levels were compared in patients with ischemic or hemorrhagic stroke.

**Results:** In this study, 132 (41.25%) were 20-50 years old, and 188 (58.75%) were 51-70 years old, mean and SD was 47.65 + 5.32 years, 199 (62.19%) men and 121 (37.81%) were women, 290 (90.31%) ischemic, and 31 (9.69%) had hemorrhagic stroke, a comparison of serum LDL cholesterol levels in ischemic and hemorrhagic stroke reveals 127.21 + 34.31 in ischemic stroke and 98.65 + 3.76 in hemorrhagic stroke, p value 0.12, which is significant.

**Conclusion:** The study finds that high LDL levels are an important risk factor for ischemic stroke compared to hemorrhagic stroke. IHD is an important risk factor for ischemic stroke compared to hemorrhagic stroke. Therefore, statins should be used for ischemic stroke to minimize stroke recurrence.

**Key words:** low density lipoprotein, stroke, intracerebral hemorrhage, ischemic stroke.

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**INTRODUCTION:**

Cerebrovascular disease is the main cause of morbidity and mortality in the world. Stroke is defined as the sudden onset of a neurological deficit that can be attributed to the focal vascular cause. Various risk factors for stroke include diabetes, ischemic heart disease, hypertension, and LDL. The incidence of cerebrovascular disease increases with age, and the number of strokes increases in the elderly population. Ischemic stroke accounts for 85% of all strokes. A number of studies have been conducted to establish the association of hypercholesterolemia with stroke. Studies on the types of ischemic and hemorrhagic strokes have shown that cholesterol is positively associated with ischemic stroke, and cholesterol is inversely related to hemorrhagic stroke, but the risk of ischemic stroke is due to high cholesterol. This is contradictory. An analysis of the literature on ischemic stroke did not show a relationship between total cholesterol levels and the frequency of ischemic stroke. Heather M Ross on the other hand found that LDL cholesterol levels above 130 mg / dl were associated with an increased risk of ischemic stroke. The relationship between LDL cholesterol levels is that the frequency of ischemic or hemorrhagic stroke is not significant. The relationship between total cholesterol, low density lipoprotein (LDL) cholesterol and stroke risk is inconsistent. Intracranial bleeding was 3 times more common (P-0.05) in men with serum cholesterol <160 mg / dL, while higher levels were associated with an increased risk of ischemic stroke. The aggressive cholesterol reduction (SPARCL) study of stroke prevention shows that statins increase ICH formation and further increase controversy. The relationship between low cholesterol and ICH-related mortality has been documented in several studies. Statins significantly reduce the risk of ischemic stroke, but this beneficial effect is partly reduced by increasing ICH. LDL levels in patients with ischemic and hemorrhagic stroke were 106.02 + 39.90 and 03.29 + 41.27, respectively. The so-called meaning of my study is to compare LDL levels in ischemic and hemorrhagic stroke because it explains some controversy in the statistical difference in LDL levels in ischemic and hemorrhagic stroke, especially in our population. It is our usual practice to prescribe statin therapy to all stroke patients, both ischemic and hemorrhagic, as well as patients with diabetes and hypertension. If average LDL levels have been shown to increase significantly in ischemic stroke compared to patients with hemorrhagic stroke, it can help us further reduce the frequency of ischemic stroke by initiating

early statin therapy to control levels. Avoid LDL and statin therapy in hemorrhagic stroke. Avoiding the risk of intracerebral bleeding. This study will also add more local data on LDL levels in ischemic and hemorrhagic stroke.

**MATERIAL & METHODS:**

This study was held in the Medicine Unit II department of Nishter Hospital Multan for one year duration from March 2019 to March 2020. 310 patients who met the inclusion and exclusion criteria were registered after obtaining informed consent. Computed tomography (brain, plane) of all patients was reviewed to determine the type of stroke, i.e. ischemic or hemorrhagic. A venous sample for LDL levels was scheduled according to protocol after 8 hours of night fasting within 24 hours after hospitalization. All samples were sent to Lahore Mayo Hospital Clinic Laboratory. All relevant information was recorded, including LDL levels and confusing variables such as diabetes (fasting blood sugar > 110 mg / dl) and hypertension (systolic blood pressure > 140 mmHg, diastolic blood pressure > 90 mmHg) in a form specially designed for this purpose. Mean LDL levels were compared in patients with ischemic or hemorrhagic stroke. The data were entered and analyzed using SPSS version 18.0. The quantitative variables in the study are age and LDL levels and are presented as mean and standard deviation. The qualitative variables in the study were gender and ischemic or hemorrhagic stroke. They are presented in frequency and percentage. The Student's t-test was carried out in both groups by comparison with quantitative variables such as mean LDL levels. To see the impact of variables in the study, stratification was made for various variables such as age, gender, risk factors (diabetes and hypertension). If less than 0.05, the P value is considered significant.

**RESULT:**

A total of 310 cases were recorded that met the inclusion / exclusion criteria to determine the incidence of patients with ischemic or hemorrhagic stroke in a tertiary hospital and to compare mean LDL levels in ischemic and hemorrhagic stroke. The age distribution of patients was 132 (41.25%) aged 20–50 years, 188 (58.75%) aged 51–70 years, mean and standard deviation was 47.65 + 5.32 years. (Table 1) The gender distribution shows that 199 (62.19%) men and 121 (37.81%) are women. (Table 2) The incidence of stroke was reported as 289 (90.31%) ischemic, and 31 (9.69%) had hemorrhagic stroke. (Table 3) Comparison of serum LDL cholesterol levels in ischemic and hemorrhagic

stroke 127.21 + 34.31 in ischemic stroke and 98.65 + 3.76 in hemorrhagic stroke, p-value is 0.012 (Table 4). Stratification for frequency prevalence of stroke by age, 132 between 20-50 years old 119 (90.15%) patients had ischemic stroke, 13 (9.85%) had hemorrhagic stroke, and 170 (90.43%) of 188

(51-70 years old) had ischemic stroke and 18 (9.57%) had hemorrhagic stroke (Table 5). Stratification by type of stroke by gender, ischemic stroke in 180 (90.45%) men, hemorrhagic stroke in 19 (9.55%), 109 (90.80%) women in 121, hemorrhagic stroke in 12 (9.92%).

**Table 1: Age distribution (n=320)**

Age (in years)	No. of patients	%
20-50	132	41.25
51-70	188	58.75

Mean and SD: 47.65+5.32

**Table 2: Gender distribution (n=320)**

Gender	n	%age
Male	199	62.19
Female	121	37.81

**Table 3: Frequency of type of stroke (n=320)**

Type of stroke	n	%age
Ischemic	289	90.31
Haemorrhagic	31	9.69

**Table 4: Comparison of serum ldl cholesterol levels in ischemic and hemorrhagic stroke**

Serum lipid type	Stroke type	Mean+SD
LDL-Cholesterol (< 150 mg/dl)	Ischemic Stroke	127.21+34.31
	Hemorrhagic Stroke	98.65+3.76

P value=0.012

**Table 5: Stratification for frequency of type of stroke according to age (n=320)**

Age (yrs)	n	Ischaemic stroke	Haemorrhagic stroke
20-50	132	119(90.15%)	13(9.85%)
51-70	188	170(90.43%)	18(9.57%)

**Table 6: Stratification for frequency of type of stroke according to age**

Gender	n	Ischaemic stroke	Haemorrhagic stroke
Male	199	180(90.45%)	19(9.55%)
Female	121	109(90.08%)	12(9.92%)

## DISCUSSION:

Stroke is a global public health problem associated with unpleasant consequences. This is an important health problem in developing countries around the world. The number of stroke patients is increasing worldwide. It has many modifiable and non-modifiable risk factors that contribute to the development and progression of cerebral atherosclerosis. This study was conducted to determine the frequency of ischemic or hemorrhagic stroke in a tertiary hospital and to compare the average LDL levels in ischemic and hemorrhagic stroke. In our study, stroke rates were reported as

ischemic stroke 289 (90.31%) and hemorrhagic stroke 31 (9.69%). Comparing serum LDL cholesterol levels in ischemic and hemorrhagic stroke, 127.21 + 34.31 in ischemic stroke and 98.65 + 3.76 in hemorrhagic stroke. In our study, LDL levels increased in patients with ischemic stroke. This was comparable to Sulheriaet in 40 patients with ischemic stroke, LDL levels increased in 22 (55%) patients and normal in 18 (45%) patients. High LDL levels in patients with ischemic stroke were observed in 42 (42%) Mahmood et al. LDL levels in hemorrhagic stroke were relatively normal after ischemic stroke. This is comparable to Sulheria

et al., Where LDL levels increased in 18 (45%) 40 patients with hemorrhagic stroke and is normal in 22 (55%) patients. Mahmood et al. High LDL levels were observed in 22 patients (22%) with hemorrhagic stroke. By comparison, there were significantly more patients with ischemic stroke than hemorrhagic stroke with high LDL levels. Your p-value is 0.000, which is significant and comparable with both studies where the p-value is less than 0.005 in both studies. Our results are more consistent with another study showing that LDL levels in patients with ischemic and hemorrhagic stroke are 106.02 + 39.90 and 03.29 + 41.27, respectively.

### CONCLUSION:

The study found that elevated LDL levels are an important risk factor for ischemic stroke compared to hemorrhagic stroke. Ischemic heart disease is an important risk factor for ischemic stroke compared to hemorrhagic stroke. Therefore, statins should be used for ischemic stroke to minimize stroke recurrence.

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