

Comparison of Low Density Lipoprotein Levels in Patients with Ischemic and Hemorrhagic Stroke

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ABSTRACT

Stroke is occurred by many factors. It is a major health problem in both developing and non-developing countries. The present study indicated that LDL levels of patients shown remarkable changes in ischemic and hemorrhagic stroke. In our study, frequency of type of stroke was recorded as 79(79%) ischemic and 21(20.07%) had haemorrhagic strokes. While on comparison of serum LDL cholesterol levels in ischemic and haemorrhagic strokes have been 137.31±38.21 recorded in ischemic stroke and 91.58±3.66 in haemorrhagic strokes respectively. This study will also add more in local data regarding LDL levels in ischemic and hemorrhagic strokes.

Keywords: Ischemic stroke, haemorrhagic, LDL cholesterol

INTRODUCTION

Stroke is a medical emergency which occurs when oxygenated blood supply to the brain is blocked. When this situation occurred the brain cells begin to die within a short time. According to a survey stroke is the fifth leading cause of death in the world (Coutts *et al.*, 2005). Strokes can occur in any age but it has concluded that their risk increases in older age. There are two main types of stroke i.e. ischemic strokes and hemorrhagic strokes. When there will be blood clots then ischemic strokes occurred and in the case of bleeding in or around the brain hemorrhagic strokes are possible. Ischemic strokes account for 87 percent of all strokes (Grundy, 2007). In case of ischemic strokes a blood clot which blocks blood flow to a part of the brain. Similarly when any weak blood vessel in the brain ruptures and bleeds into the surrounding brain tissue the condition called hemorrhagic strokes. In this situation high pressure created on blood cells and in the surrounding tissue ultimately blood supply becomes stopped and causing damage. It has estimated that about 13 % of all strokes are hemorrhagic strokes (Esposito *et al.*, 2002).

The scientific community recognized that blood lipid levels have strong association with cardiovascular diseases. Especially low-density lipoprotein (LDL) cholesterol levels show significant relationship with ischemic and hemorrhagic strokes (Hammoud *et al.*, 2000). It has documented by different studies that high levels of LDL-cholesterol contribute to the development of stroke. In a study it is estimated that reduction in plasma LDL-cholesterol

levels decreases the incidences of cardiovascular diseases and of strokes (Ishihara *et al.*, 2007).

It has proved in the study that levels of LDL cholesterol greater than 130mg/dl are linked with increased risk of ischemic strokes (Hernandez 2011). Different studies described that hypercholesterolemia is associated with strokes. Many studies explained that ischemic and hemorrhagic strokes have a positive association with cholesterol (Hadaegh, 2009).

MATERIAL & METHODS

One hundred patients were selected for the study after informed consent from all the medical wards of Jinnah hospital, Lahore. The type of stroke either it is ischemic or hemorrhagic was determined in these patients by CT scan (brain, plane). Venous blood sample was taken and serum was separated. LDL levels were scheduled as per protocol after 8 hour of overnight fasting within 24 hours of admission. All samples were sent to Biochemistry Laboratory of Lahore Medical and Dental College (LM&DC) and Ghurki Hospital, Lahore.

Statistical analysis: The means of LDL levels were compared in patients with ischemic or hemorrhagic stroke. Data was entered and analyzed using SPSS software version 16.0. Quantitative variables of the study were age and LDL levels and presented as mean±SD. P-value was considered significant if less than 0.05.

RESULTS

One hundred cases were taken with ischemic or hemorrhagic stroke from medical wards of Jinnah hospital Lahore and to compare their mean levels of LDL in ischemic and hemorrhagic stroke. Age

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distribution of the patients (Table 1) showed that 41(41%) were between 21-40 years, while 59(59%) were between 41-70 years(47.65+5.32) years. Gender distribution (Table 2) showed 76(76%) male and 23(23.99%) were females. Frequency of type of stroke was recorded as 79(79%) with ischemic and 21(20.97%) with haemorrhagic strokes (Table 3). Comparison of serum LDL cholesterol levels in ischemic and haemorrhagic stroke revealed 137.31+38.21mg/dl in ischemic and 91.58+3.66mg/dl in haemorrhagic stroke (P=0.014) (Table 4).

Table 1: Age distribution (n=100)

Age(in years)	n	%age
21-40	41	41.00
41-70	59	59.00

Table 2: Gender distribution (n=100)

Gender	n	%age
Male	76	76.00
Female	24	23.99

Table 3: Frequency of type of stroke (n=100)

Type of stroke	n	%age
Ischemic	79	79.00
Haemorrhagic	21	20.97

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	137.31+38.21
	Hemorrhagic Stroke	91.58+3.66

P value=0.014

DISCUSSION

Stroke is a burning issue of the world. It occurred by many modifiable and non-modifiable risk factors. Stroke is a biggest health problem in both developing and non-developing countries. The number of stroke's patients is increasing all over the world. The present study was conducted to determine the rate of ischemic or hemorrhagic stroke in the individuals of different gender and age. The patient's data of LDL levels were compared in ischemic and hemorrhagic stroke. In our study, frequency of type of stroke was recorded as 79(79%) ischemic and 21(20.07%) had haemorrhagic strokes. While on comparison of serum LDL cholesterol levels in ischemic and haemorrhagic strokes reveals 137.31+38.21 in ischemic stroke and 91.58+3.66 in haemorrhagic stroke.

Present study described a remarkable increased in LDL levels of patients with ischemic stroke and our results are comparable with the study of Coutts *et al.*,

(2005). Current study also show a similarities in results obtained in the study of Smolders *et al.*, (2007). In the present study there were a remarkable change has noted in the LDL levels of patients with both ischemic stroke and hemorrhagic stroke. Significantly greater no of patients with raised LDL levels in ischemic stroke than in hemorrhagic stroke has observed. Our p value is 0.014 which is significant and comparable with both studies in which p value is less than .05 in both studies.

CONCLUSIONS

The present study described that LDL levels of patients are correlated with ischemic and hemorrhagic stroke. Our study showed a significantly greater no of patients with raised LDL levels in ischemic stroke than in hemorrhagic stroke.

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