ORIGINAL ARTICLE

Frequency of Ischemic and Hemorrhagic Stroke and Comparison of Low Density Lipoprotein Levels in these patients

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ABSTRACT

Aim: To determine the frequency of patients presenting with ischemic or hemorrhagic stroke in a tertiary care hospital and to compare mean levels of LDL in ischemic and hemorrhagic stroke.
Methods: A total of 310 patients of both gender age group 20 to 70 years were selected for this study. This study was conducted from 01st July 2013 to 31st December 2013 in all medical wards of mayo hospital. CT scan brain plain of all patients were reviewed for determination of type of stroke that is ischemic or hemorrhagicVenus sample for LDL levels were scheduled as per protocol after 8 hours of overnight fasting within 24 hours of admission. All the relevant information including LDL levels and confiding variables like diabetes, fasting blood sugar >110 and hypertension, systolic BP > 140, diastolic BP >90 were noted on proforma especially design for this purpose. The means of LDL levels were compared in patients with ischemic or hemorrhagic stroke.
Result: In this study,132(41.25%) were between 20-50 years, while 188(58.75%) were between 51-70 years, mean and sd was 47.65+5.32 years, 199(62.19%) male and 121(37.81%) were females, 290(90.31%) ischemic and 31(9.69%) had hemorrhagic stroke, 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 result of study concludes that Increased LDL levels are major risk factor for ischemic stroke as compared to hemorrhagic stroke. IHD is a major risk factor for ischemic stroke as compared to hemorrhagic stroke.So statins must be used in ischemic stroke to minimize recurrent stroke.
Keywords: Low density lipoproteins, stroke, Intracerebral hemorrhage, Ischemic stroke.

INTRODUCTION

Cerebrovascular disease is the leading cause of morbidity and mortality throughout world. Stroke is defined as abrupt onset of a neurological deficit that is attributable to a focal vascular cause.[1] Various risk factors for stroke include diabetes mellitus, ischemic heart disease, hypertension and also LDL[2]. The incidence of cerebrovascular diseases increase with age and the number of stroke are increased in elderly population[1]. Ischemic stroke accounts for upto 85% of all strokes[4].

Many studies have been done to find association of hypercholesterolemia with stroke. Studies that examined ischemic and hemorrhagic stroke types have found a positive association of cholesterol with ischemic stroke and an inverse association of cholesterol with hemorrhagic stroke but the evidence regarding the risk of ischemic stroke due to elevated cholesterol levels is conflicting[4]. The analysis of the literature on ischemic stroke showed no association between total cholesterol levels and ischemic stroke incidence[5]. While Heather M Ross found that levels of LDL cholesterol greater than 130mg/dl are linked with increased risk of ischemic stroke.[10] Association between LDL cholesterol levels are the incidence of ischemic or hemorrhagic stroke were not significant[11]. The relationship between total Cholesterol, Low density lipoprotein cholesterol (LDL) and stroke risk is inconsistent[3]. Intracranial hemorrhage was 3 times more common (P-0.05) in men with serum cholesterol levels<160mg/dL compared with those with higher levels, whereas higher levels were associated with an increased risk of ischemic stroke (P-o.oo7)[12].

Stroke Prevention by Aggressive Reduction in Cholesterol (SPARCL) study suggests that Statins increases the occurrence of ICH, which enhances the controversy[6]. An association between low cholesterol levels and mortality attributable to ICH has been documented in several studies.[7] Statins significantly reduces the risk of ischemic stroke but this beneficial effect is partly reduced by increasing ICH[8]. It was seen that LDL levels in patients of ischemic and hemorrhagic stroke were 106.02+39.90 and 03.29+41.27 respectively[9].

The purported significance of my study is to compare LDL levels in ischemic and Hemorrhagic

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stroke to further clarify some controversies in statistical difference of LDL levels in ischemic and hemorrhagic stroke especially in our population, as it is our routine practice that we prescribe statin therapy of all stroke patients whether ischemic or hemorrhagic and also to diabetic and hypertensive patients. If it is proved that mean LDL levels is significantly raised in ischemic stroke as compared to hemorrhagic stroke patients, it may help us to further reduce the incidence of ischemic stroke by starting statin therapy early to control LDL levels and avoiding statin therapy in hemorrhagic stroke hence avoiding risks of intracerebral hemorrhage. This study will also add more in local data regarding LDL levels in ischemic and hemorrhagic stroke.

MATERIAL & METHODS

310 patients fulfilling the inclusion and exclusion criteria were enrolled after informed consent from all the medical wards of mayo hospital Lahore. CT scan (brain, plane) of all patients were reviewed for determination of type of stroke i.e. ischemic or hemorrhagic. Venous sample for LDL levels were scheduled as per protocol after 8 hour of overnight fasting[10] within 24 hours of admission. All samples were sent to Clinical Lab of Mayo Hospital, Lahore. All the relevant information's including LDL levels and confounding variables like diabetes (fasting blood sugar level>110mg/dl) and hypertension (systolic blood pressure>140mmHg, diastolic blood pressure >90mmHg) were noted on a proforma especially designed for this purpose. The means of LDL levels were compared in patients with ischemic or hemorrhagic stroke. Data was entered and analyzed using SPSS software version 10.0. Quantitative Variables of the study are age and LDL levels and these are presented as mean and standard deviation. Qualitative variables of the study are gender, and ischemic or hemorrhagic stroke. These are presented as frequency and percentage. Student's 't' test was applied in comparison of Quantitative variables like mean LDL levels in both groups. Stratification was done on different variables like age, gender, risk factors (Diabetes and hypertension) to see the effect of variables on the study. P-value is considered significant if less than 0.05.

RESULT

A total of 320 cases fulfilling the inclusion/exclusion criteria were enrolled to determine the frequency of patients presenting with ischemic or hemorrhagic stroke in a tertiary care hospital and to compare mean levels of LDL in ischemic and hemorrhagic stroke.

Age distribution of the patients show that 132(41.25%) were between 20-50 years, while 188(58.75%) were between 51-70 years, mean and sd was 47.65+5.32 years. (Table 1)

Gender distribution shows 199(62.19%) male and 121(37.81%) were females. (Table 2)

Frequency of type of stroke was recorded as 289(90.31%) ischemic and 31(9.69%) had haemorrhagic stroke. (Table 3)

Comparison of serum LDL cholesterol levels in ischemic and haemorrhagic stroke reveals 127.21+34.31 in ischemic stroke and 98.65+3.76 in haemorrhagic stroke, p value 0.012, which is significant (Table 4.)

Stratification for frequency of type of stroke according to age reveals that out of 132 cases between 20-50 years shows 119(90.15%) had ischemic stroke while 13(9.85%) had haemorrhagic stroke, and out of 188 cases between 51-70 years 170(90.43%) had ischemic stroke while 18(9.57%) had haemorrhagic stroke (Table 5.)

Stratification for frequency of type of stroke according to gender reveals that out of 199male cases 180(90.45%) had ischemic stroke while 19(9.55%) had haemorrhagic stroke, and out of 121female cases,109(90.80%) had ischemic stroke while 12(9.92%) had haemorrhagic stroke (Table 6).

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 cholestrol levels in ischemic and hemorrhagic stroke

Serum lipid type	Stroke type	Mean+SD
LDL-Cholestrol (< 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 disturbing consequences. It is a major health problem in developing countries of the world. Number of patients suffering from stroke is increasing all over the globe. It has many modifiable and non modifiable risk factors that contribute to the development and progression of atherosclerotic cereberovascular disease.

Present study was conducted to determine the frequency of patients presenting with ischemic or hemorrhagic stroke in a tertiary care hospital and to compare mean levels of LDL in ischemic and hemorrhagic stroke. In our study, frequency of type of stroke was recorded as 289(90.31%) ischemic and 31(9.69%) had haemorrhagic stroke. While on comparison of serum LDL cholesterol levels in ischemic and haemorrhagic stroke reveals 127.21+34.31 in ischemic stroke and 98.65+3.76 in haemorrhagic stroke.

In our study LDL levels were increased in ischemic stroke patients. This is comparable with the Sulheriaet al[81] in which out of 40 ischemic stroke patients, LDL levels were increased in 22(55%) patients and these were normal in 18(45%) patients. In Mahmood et al[13] out of 100 patients, increased LDL levels were seen in 42(42%) patients of ischemic stroke.

LDL levels in haemorrhagic stroke were comparably normal than ischemic stroke. This is comparable with the Sulheria et al[81] in which out of 40 hemorrhagic stroke patients, LDL levels were increased in 18(45%) patients and these were normal in 22(55%) patients. In Mahmood et al[13] out of 100 patients, increased LDL levels were seen in 22(22%) patients of hemorrhagic stroke.

On comparison, there were significantly greater no of patients with raised LDL levels in ischemic stroke than in hemorrhagic stroke. Our p value is 0.000 which is significant and comparable with both studies in which p value is less than .005 in both studies.

Our results are further in agreement with another study who revealed that LDL levels in patients of ischemic and hemorrhagic stroke were 106.02+39.90 and 03.29+41.27 respectively[9].

CONCLUSION

Present study concluded that Increased LDL levels are major risk factor for ischemic stroke as compared to hemorrhagic stroke. Ischemic heart disease is a major risk factor for ischemic stroke as compared to hemorrhagic stroke. So statins must be used in ischemic stroke to minimize recurrent stroke.

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