ORIGINAL ARTICLE

Lipid Profile in Cerebrovascular Accidents

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ABSTRACT

Aim: To assess the prevalence of high cholesterol and triglycerides in patients with diabetes mellitus, hypertension and cerebrovascular accident.

Methods: This study was carried out in the Department of Medicine, Multan Medical and Dental College/Ibn-e-Siena Hospital and Research Institute, Multan from June 2015 to May 2016. A total of 150 cases were included in the study after fulfilling the inclusion/exclusion criteria.

Results: Out of 150 patients 93 (62%) patients showed isolated stroke, 57 (38%) showed isolated diabetes mellitus. Isolated hypertension was found in 21 (7%), 6 (2%) patients showed combined hypertension, CVA and diabetes mellitus. 18 (6%) patients exhibited combined hypertension and stroke. 20 (6.7%) patients were having combined diabetes mellitus and hypertension and 7 (2.3%) patients exhibited combined diabetes mellitus and stroke.

Key words: Diabetes mellitus, Hypertension, Cerebrovascular accident.

INTRODUCTION

Stroke is defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function lasting for at least 24 hours with no apparent cause other than of vascular origin[1]. Cholesterol is a fatty material, which over the years thickens and narrows the arterioles. It is manufactured in the liver and is an essential element of blood. It is present abundantly in egg yolk, butter, cream, animal fat and milk. Hypertensive retinopathy is among the vascular complications of essential hypertension. It is known that the auto-regulation of retinal circulation fails as blood pressure increases beyond a critical limit. However, elevated blood pressure alone does not fully account for the extent of retinopathy[2].

Stroke is the cause of one in eight deaths. It also constitutes a dreadful burden of disability for the patients and their relatives. Therefore, effective risk factor intervention represents the most appropriate to reduce stroke morbidity and mortality. While some risk factors such as hypertension and atrial fibrillation have been recognized as independently related to stroke occurrence, the predictive role of lipid profile has not yet been well established, similar to that reported in myocardial infarction[3,4].

There are various risk factors such as age, gender, familial trends, race and ethnic groups and modifiable factors such as hypertension, cardiac disease, diabetes mellitus, dyslipidaemia, smoking, alcohol abuse, physical inactivity, asymptomatic carotid stenosis and transient ischaemic attacks[5].

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Risk factors for strokes have been studied locally[6]. The relationship of serum lipids and lipoproteins with cerebrovascular disease are being studied along with many other risk factors as in coronary heart disease[7]. Several clinical trials showed an association between high concentrations of serum cholesterol and ischaemic stroke[8].

The major risk factors contributing to the excess of cardiovascular disease caused by diabetes includes hyperglycemia, insulin resistance, dyslipidemia, hypertension and smoking. Dyslipidemia in hypertensive patients is itself known to be a predisposing risk factor, an aggravating or complicating factor[9]. Hypertension and hyperlipidemia not only accelerate atherogenesis but also cause degenerative changes in the walls of large- and medium-sized arteries[10], which accelerate cerebrovascular hemorrhage[11], ischemic heart disease[12], stroke, and cardiac arrest[13].

Many of the previous clinical investigations have suggested that increased serum cholesterol is a risk factor for ischemic stroke. Its role in Intracerebral hemorrhage (ICH), however, is not clear. Few studies have indicated hypercholesterolemia as a risk factor for ICH[14].

PATIENTS AND METHODS

Department of Medicine, Multan Medical and Dental College/Ibn-e-Siena Hospital and Research Institute, Multan from June 2015 to May 2016. A total of 150 cases were included in the study after fulfilling the inclusion/exclusion criteria.

RESULTS

Out of 150 patients, 76(50.7%) were male and 74(49.3%) were female. As regards dyslipidemia in CVA, hypertriglyceridemia was present in 18(46%) male and 21(54%) in female patients whereas hypercholestero-lemia was seen in 9(60%) male and 6(40%) in female patients. Dyslipidemia in patients of hypertension, hypertriglyceridemia was present in 12(67%) male and 6 (33%) in female patients and hypercholesterolemia was seen in 6 (67%) male and 3(33%) in female patients. Dyslipidemia in diabetic patients, hyper-triglyceridemia was present in 15(38%) male and 24(68%) in female patients, hypercholesterolemia was seen in 12(50%) male and 12(50%) in female patients.

Table 1: Triglycerides and cholesterol level in CVA (n=300 with CVA 48)

Age (years)	Male	Female
< 40	05	05
41-50	04	04
51-60	13	07
61-70	03	05
>70	02	-
Total	27	21

Table 2: Triglycerides and cholesterol level in patients with hypertension (n=300 with hypertension 23)

Age (years)	Male	Female
< 40	04	02
41-50	-	-
51-60	05	03
61-70	02	05
>70	02	-
Total	13	10

Table-3: Triglycerides and cholesterol level in patients with diabetes (n=300 with diabetes 60)

Age (years)	Male	Female
< 40	18	06
41-50	05	03
51-60	14	08
61-70	04	02
>70	-	-
Total	41	19

DISCUSSION

Stroke is a clinical syndrome characterized by rapidly developing symptoms and/or signs of focal and at times global loss of cerebral functions, with symptoms lasting more than 24 hours or leading to death with no apparent cause other than that of vascular origin[15]. According to World Health Organization report for 2002, total mortalities due to stroke in Pakistan were 78512[16].

In the present study 60 (36.4%) patients of the total 150 patients with mean age of 54 years were suffering from isolated diabetes mellitus. Of these 60 patients, 45% were male while 55% were female. In this study 21% of the patients were having increased level of serum cholesterol and 34.2% patients having increased level of triglyceride (>150 mg/dl). When we compare this study with a study, it was found that 24% of the population was smoker and 64% of the patients were having sedentary life style[17].

Another study showed that the effect of flavastatin HMG CoA reductase inhibitor was assessed in 50 patients with dyslipidemia in diabetic belonged to the city of Lahore[18]. In this study the total cholesterol and triglyceride were high. When compare this study with the present one, total cholesterol and triglycerides are quite low in present study. The reason is financial status, difference between people belonging to Lahore and our area.

Hyperglyperidemia is most common lipid abnormality in NIDDM, particularly in diabetics with poor glycemic control[19]. The above observation was also seen in present study. Triglyceride levels were above the desired level in 34.2% patients out of 60 patients, with mean triglyceride level below 150 mg/dl. Hyperclyceridemia is a potent risk factor for macrovascular disease due to reduced synthesis of insulin dependent lipoprotein lipase in liver, resulting in impaired clearance of LDL, cholymicron and VLDL remnants[20]. High triglyceride levels are associated with hypercoagulopathy and decreased fibrinolysis both contributing to coronary heart disease[21]. In addition to metabolic relation to LDL cholesterol modifying its particle into more dense, small and hence more atherogenic form[22].

In the present study 23 (15.3%) patients with mean age of 63 years were suffering from isolated hypertension. Of these 57% were male while 43% had increased level of triglyceride. In these patients 32% were smoker. The similar study showed that 16% of the patients were having hyperglyceridemia and 5% of patients were having both raised triglyceride and cholesterol[23].

In our study more patients had increased level of cholesterol and triglyceride. The exact cause of increased cholesterol and triglyceride in present study is not known. A study carried out reveals that 48% of patients were having hypercholesterolemia[24]. Another study showed that 50% of the patients had dyslipidemia and 39% had hypertriglyceridemia[25].

Denti et al reported that LDL-C concentrations over 100 mg/dl along with low HDL-C levels were associated with higher stroke risk[26]. Findings of the present study indicating no role for TG in the ischemic strokes are on the contrary to that of certain

previous studies; the variable, however, showed a protective effect in patients with ICH[127].

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