Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-95 (p) ISSN Print: 2348-6805

Original Research

An investigation of the involvement of dyslipidemia and other unknown risk factors in ischemic stroke in our community

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ABSTRACT:
Aim: An investigation of the involvement of dyslipidemia and other unknown risk factors in ischemic stroke in our community. **Methods:** This research comprised 90 people who were admitted to the Medicine Department for an assessment of chest pain and were later found to be angiography positive. BMI was calculated by multiplying a person's weight in kilogrammes by their height in metres squared. Blood samples were obtained 14 hours after fasting. Cholesterol oxidase, an enzymatic reaction, was employed to test lipids, and the Freidwald technique was used to calculate LDL cholesterol and very low-density lipoprotein cholesterol. **Results:** Males had a higher proportion of T2DM, dyslipidemia, and high blood pressure than females. Total cholesterol (170.8815.96 vs. 200.117.85, P = 0.69) and LDL cholesterol (105.027.23 vs. 100.026.63, P = 0.59) levels in individuals with and without atherogenic dyslipidemia were similar. There was no statistically significant difference in the proportion of individuals with hypercholesterolemia between those who had atherogenic dyslipidemia and those who did not. Cardiovascular risk variables were shown to be much greater in individuals with atherogenic dyslipidemia, with a statistically significant difference in both groups. **Conclusion:** Hypertriglyceridemia and low HDL cholesterol are more common in people with CAD than hypercholesterolemia. This demonstrates the need for a new preventive strategy among Indians with CAD.
Keywords: Dyslipidemia, Ischaemic stroke, unidentified risk factors

Received: 14 March, 2018 Accepted: 17 April, 2018

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This article may be cited as: Singh BK, Kumar S. An investigation of the involvement of dyslipidemia and other unknown risk factors in ischemic stroke in our community. J Adv Med Dent Scie Res 2018;6(5):123-126.

INTRODUCTION

Stroke is the world's second greatest cause of mortality, accounting for 11.13 percent of all fatalities, and the major cause of disability. Ischemic stroke accounts for about 87 percent of all stroke cases. [1] According to the Global Burden of Disease (GBD) research, more than 11 million ischemic strokes occurred in 2010, with 63 percent occurring in low and middle-income nations. In addition, about 3 million people died as a result of an ischemic stroke. [2] A hemorrhagic stroke accounts for around 13% of all strokes.[1] According to a GBD research from 2010, there were around 5.3 million hemorrhagic stroke cases, with approximately 80% occurring in low- and middle-income countries. Hemorrhagic stroke claimed the lives of about 3 million people. [3,4] According to the Mashhad Stroke Incidence Study, which was conducted in 2006-2007, the age-adjusted incidence rate of stroke was 203 per 100,000 individuals per year (95 percent CI: 175-231), and this rate could be divided into 113 (95 percent CI: 142-192), 26 (95 percent CI 16-36), and 4 (95 percent CI 0-8) per 100000 per year for ischemic, intracerebral haemorrhage, [5] South Asians are more likely to have metabolic abnormalities such as increased visceral fat, elevated triglycerides (TG), and poor high density lipoprotein (HDL) cholesterol. [6-8] Dyslipidemia is a key, generally accepted independent significant risk factor for coronary artery disease (CAD), and it may even be a requirement for CAD, occurring before other major risk factors. [9] Studies have shown that Asians have a greater prevalence of lipid abnormalities than non-Asians. [10,11] Low HDL cholesterol and high TG concentrations have been linked to CVD risk[11,12] and the combination of these two disorders is known as

atherogenic dyslipidemia. Asian Indians had greater rates of low HDL cholesterol and lower rates of high cholesterol than non-Asian Indians, indicating decreased reverse cholesterol transfer. These data imply that high TG and low HDL cholesterol are more important in Asian Indians than high cholesterol, which is more frequent in western nations, which may have therapeutic implications. Despite its significant contribution to CVD in other global populations, the influence of dyslipidemia on the burden of CVD in native Asians has been understudied. Asian Indians have a low rate of hypercholesterolemia but a high prevalence of atherogenic dyslipidemia, which might be therapeutic.

MATERIALS AND PROCEDURES

A prospective observational research at the Department of Medicine looked at the link between dyslipidemia and cardiovascular risk factors in 90 angiographically confirmed CAD patients. All patients had their anthropometry and cardiovascular risk factors evaluated, and blood samples were drawn to examine biochemical and inflammatory markers. This research comprised 90 people who were admitted to the Medicine Department for an assessment of chest pain and were later found to be angiography positive. Chronic renal disease, hepatic impairment, and known endocrine dysfunction Height, weight, waist circumference, and hip circumference were all taken into account. BMI was calculated by multiplying a person's weight in kilogrammes by their height in metres squared. T2DM defined as a history and criteria supplied by the American Diabetes Association-2012, and hypertension (HTN) defined as systolic and diastolic blood pressures of 140 and 90 mmHg, respectively. Atherogenic dyslipidemia was defined as TG levels of 150 mg/dl and HDL cholesterol levels of 40 mg/dl regardless of the patient's gender. Individual lipid abnormalities were also assessed in this research, and groups were generated depending on lipid abnormalities' existence or absence. Blood samples were obtained 14 hours after fasting. Cholesterol oxidase, an enzymatic reaction, was employed to test lipids, and the Freidwald technique was used to calculate LDL cholesterol and very low-density lipoprotein cholesterol. The inter assay accuracy was 3.84 percent and the intra precision was 2% for all biochemical parameters. Hemoglobin A1c was determined using HPLC. C-reactive protein, which is very sensitive (hsCRP).

STATISTICAL INVESTIGATION

SPSS Version 25 was used for statistical analysis. Unless otherwise noted, data were given as mean SD, median, or number (percent). The Chi-square test was used to assess all non-parametric data, including HTN, dyslipidemia, smoking, and the number of vessels involved. The Chi-square test was used to assess all non-parametric data. A $P > 0.05$ was deemed statistically significant.

RESULTS

A total of 90 people with known CVD were studied (male: 55, female: 35, age: 59.02 3.66 years). reflects the baseline features of the persons Males and females did not differ in terms of age (Male: 59.9810.36; Female: 55.879.63; $P = 0.66$). Males showed greater dyslipidemia levels than females. Males had a higher proportion of T2DM, dyslipidemia, and high blood pressure than females.

Total cholesterol (170.8815.96 vs. 200.117.85, $P = 0.69$) and LDL cholesterol (105.027.23 vs. 100.026.63, $P = 0.59$) levels in individuals with and without atherogenic dyslipidemia were similar. There was no statistically significant difference in the proportion of individuals with hypercholesterolemia between those who had atherogenic dyslipidemia and those who did not.

In the third table Cardiovascular risk variables were shown to be much greater in individuals with atherogenic dyslipidemia, with a statistically significant difference in both groups.

Table 1: Basic parameter of the patients

Parameters	Male(n=55)	Female(n-35)	P Value
Age	59.98±10.36	55.87±9.63	0.66
Smoking	38(69.09%)	3(8.57%)	0.0001
BMI	29.22±2.36	31.02±1.69	0.07
WHR	0.89±0.03	0.91±0.05	0.21
T2DM	40(72.73%)	21(60%)	0.16
HTN	30(54.54%)	11(31.43%)	0.03
Dyslipidemia	31(56.36%)	15(42.86%)	0.21

Table 2: Lipid profile and hs CRP of the patients

Parameters	Male(n=55)	Female(n-35)	P Value
T. Cholesterol	170.88±15.96	200.11±7.85	0.69
Triglyceride	294.75±69.58	210.02±34.87	0.05
HDL	39.88±7.85	38.96±7.26	0.59
LDL	105.02±7.23	100.02±6.63	0.52

Hs CRP	12.77±1.55	11.96±1.78	0.32
HbA1C	6.93±1.52	6.63±1.26	0.63

Table 3: Cardiovascular risk factors with atherogenic dyslipidemia

Parameters	Present(n=51)	Absent (n-39)	P Value
T. Cholesterol	249.55±25.63	176.11±10.37	<0.001
Triglyceride	300.11±98.66	181.11±6.36	<0.001
HDL	29.01±2.36	45.01±9.61	0.003
LDL	147.02±7.21	80.21±4.02	<0.001
Hs CRP	16.02±3.02	10.11±3.56	<0.001
HbA1C	8.58±1.69	5.74±1.63	<0.001

DISCUSSION

Despite having a normal body mass index (BMI), South Asians have a greater frequency of cardiovascular risk factors, type-2 diabetes mellitus (T2DM), and an earlier start of cardiovascular disease (CVD). Individuals of Indian Asian heritage are estimated to contribute for 40-60% of the worldwide CVD burden during the next 10-15 years. Several population-based prospective studies have been conducted to examine the impact of dyslipidemia on CVD. Several research from various areas of India have discovered distinct forms and frequencies of dyslipidemia. High TG (28-72.2 percent), high LDL cholesterol (23.3-44.5 percent), low HDL (27-percent), and high total cholesterol (19-38.7 percent) were observed in the north, west, and southern areas of India. [13] These differences may be explained by variations in the research population's age and gender distribution, the inclusion of CVD patients, and whether the study was done in a community or hospital environment. Only a few studies have investigated the differential connections between different dyslipidemias and CVD risk variables in individuals with angiographically diagnosed CAD. [13] A considerable rise in TG was discovered in a study done in India (Delhi) among young (less than 40 years old) CAD patients. In our study, 56.67 percent of patients had atherogenic dyslipidemia. In an Italian study identical to ours, those with atherogenic dyslipidemia had comparable total cholesterol levels to those without atherogenic dyslipidemia. [14] In contrast to atherogens, most western studies[15] and NHANES data[16] underlined the role of increased LDL and TC in the development of CAD. As previously mentioned, low HDL and high TG levels are more important in the Indian population as cardiovascular risk factors than in the Western population. [17] Atherogenic dyslipidemia is associated with age, gender, BMI, and central obesity. [18] In this study, however, there was no difference in age, gender, BMI, or WHR between persons with and without dyslipidemia. An Italian study revealed similar results, with no difference in BMI between people with and without dyslipidemia and CAD. [14] Our study's subjects all had known CAD, which would have masked the relationship between dyslipidemia, BMI, and WHR. According to International and Indian guidelines,[19] the majority of our patients had a mean WHR >0.9 and a mean BMI >25, which were already higher than the usual population, which might explain the absence of a relationship in our research. Patients with atherogenic dyslipidemia exhibited a significantly higher prevalence of T2DM and/or HTN than those without. In other investigations, the prevalence of HTN did not vary between patients with and without atherogenic dyslipidemia. [13] In univariate analysis, serum TG was shown to be positively associated with the presence of T2DM and HTN, while HDL cholesterol was found to be negatively associated with the presence of T2DM and HTN.

CONCLUSION

Hypertriglyceridemia and low HDL cholesterol are more common in people with CAD than hypercholesterolemia. This demonstrates the need for a new preventive strategy among Indians with CAD.

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