

Dyslipidemia Incidence and Correlation in Patient Outcome Prediction a Cerebrovascular Accident Diagnosis: A Prospective Cross Sectional Analysis

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Abstract

Background: It has been stated that one of the risk factors for ischemic stroke is lipid abnormalities. Studies that compare a patient's lipid profile with their stroke pattern (hemorrhage and infarction) are scarce, nonetheless. Incidence and association of lipid abnormalities in patients with cerebrovascular accidents (CVAs) were the focus of this investigation.

Methods: Between October 2020 and March 2021, 127 participants were examined in the Department of Medicine at Darbhanga Medical College and Hospital in Laheriasarai, Bihar, after being split into Cases (n = 102, with CVA) and Controls (n = 25, without CVA). For every subject, a thorough history and lipid profile were documented. Each patient's brain CT/MRI was used to examine their stroke pattern.

Results: The majority of respondents in the Cases and Control groups are between the ages of 61 and 85 (45.09%) and 41 and 60 (44%), respectively. The majority of patients in the Cases group were males (61.76%), while the majority of patients in the Control group were females (84%). Smokers made up the majority of the cases (53.92%). Infarction was more common among smokers in the Case group (55%) than hemorrhage (51%). The prevalence of dyslipidemia was higher in patients (56.86%) than in controls (28%; p=0.009). Compared to patients who had hemorrhage (45.94%), the majority of infarct patients (63.07%) had dyslipidemia. The primary cause of cases was a reduction in high density lipoprotein (HDL) levels (74%), which was followed by a fall in total cholesterol (64%). 71.42% of the 14 patients in Cases who passed away had dyslipidemia.

Conclusion: More often than hemorrhagic stroke, ischemic stroke was associated with lower HDL levels. Dyslipidemia was most frequently observed in patients with stroke.

Keywords: Dyslipidemia, Stroke Pattern, Cerebro Vascular Accidents, Smokers.

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Introduction

Rapidly developing symptoms and/or indicators of localized and global loss of brain function that can persist for at least 24 hours without any apparent explanation other than vascular origin are known as cerebrovascular accidents (CVAs) or strokes. The second leading cause of death worldwide, according to data released by the World Health Organization, is stroke.[1] According to the American Heart Association's most recent figures, stroke causes around 801,000 deaths in the United States.[2] According to recent research conducted on the Indian population, the age-adjusted prevalence rate of stroke was 250–350 per 100,000.[3] Although atrial fibrillation and hypertension are independent risk factors for CVA,

there is a dearth of information regarding the prognostic significance of aberrant lipid profiles in the Indian population.[4] Although elevated total cholesterol (TC) has been implicated in the development of CVA in numerous prior investigations, it is unclear how TC and other lipid parameters relate to hemorrhagic stroke.[5,6] Therefore, the goal of the current investigation was to determine whether dyslipidemia or an aberrant lipid profile was associated with CVA in the Indian population.

Material and Methods

Between October 2020 and March 2021, a cross-sectional prospective study was conducted at the

Department of Medicine, Darbhanga Medical College and Hospital, Laheriasarai, Bihar, involving 102 CVA patients (Cases group) and 25 age and sex-matched healthy individuals (Control group, no CVA). After taking detailed history from each patient, clinical diagnosis and laboratory investigation including lipid profile was performed on all the subjects.

Patients having age between 20-85 years of either sex with clinical finding (brain CT/MRI) of CVA were included in the present study. Patients with liver disease, familial hypercholesterolemia, taking anti lipid and sympathomimetic drugs, transient ischemic attack (TIA) neurological symptoms recovered within 24 hours, secondary to cerebral tumor, trauma or previous coagulation disorder, not giving informed consent, preexisting thyroid disorder and patient on thyroxine therapy and pregnancy and postpartum hypothyroidism were excluded from the study.

All the data were analyzed using IBM SPSS-ver.20 software. Analysis was performed using chi-square test and independent sample student t test. P values <0.05 was considered to be significant.

Results

The most prevalent age ranges for Cases and Control were 41–60 years [11 (44%)] and 61–85

years [46 (45.09%)], respectively. In the case groups, the majority of patients were male [63 (61.76%)], while in the control groups, the majority were female [21 (84%)].

Infarction was the most frequent stroke pattern among the 102 CVA patients [65 (63.72%)], followed by hemorrhage [37 (36.27%)]. Of the 55 smokers in the Case group, 36 (55%) experienced an infarct, and 19 (51%) experienced a hemorrhage; in contrast, among the 47 nonsmokers, 29 (61.70%) experienced an infarct, and 18 (38.29%) experienced a hemorrhage ($p=0.0001$).

58 (56.86%) and 7 (28%) of the individuals in the case and control groups, respectively, had dyslipidemia ($p=0.009$). Dyslipidemia was seen in 41 (63.07%) of the 65 infarct cases and 17 (45.94%) of the 37 hemorrhagic stroke patients ($p=0.14$).

The most prevalent pattern of dyslipidemia seen in stroke was a decrease in HDL levels [43 (74%) in cases and 7 (100%) in controls], which was followed by a rise in total serum cholesterol [37 (64%) in cases].

Ten (71.42%) of the 102 stroke patients had dyslipidemia, and 14 (13.72%) of them lost.

Table 1: Pattern of lipid profile in relation to CVA type

Lipid profile pattern	Infarct (n=65)	Hemorrhage (n=37)	Total (n=102)	P value
Increased TC	27(72.97)	10 (27.02)	37 (100)	NS
Increased TG	17 (68)	8 (32)	25 (100)	NS
Decreased HDL	33 (76.74)	10 (23.25)	43 (100)	0.03

Data is expressed as no of 0patients (percentage), NS; not significant, TC; total cholesterol, TG; triglyceride; HDL; high density lipoprotein, p value of <0.05 is considered as

Discussion

One of the four leading causes of death worldwide, ischemic stroke is linked to substantial morbidity and mortality. The primary causes of CVA are ICH and infarction.[7] The risk of stroke is determined by a number of risk factors and causes. It is believed that one of the risk factors for stroke is an abnormal lipid profile.[6]

In their study of 258 acute stroke patients, Togha et al. found that ischemic stroke was more common than hemorrhagic stroke, and that the majority of ischemic stroke patients had elevated TC levels.[7]

In contrast, the majority of brain infarct patients in this study had lower HDL values. However, studies by Denti et al. revealed low HDL-C levels and a greater concentration of LDL-C (100 mg/dl), both of which were linked to an increased risk of stroke.[8,9]

According to Cynthia et al., dyslipidemia was present in 56% of stroke patients, which is

completely in line with the findings of our investigation. In line with the results of the current investigation, Cynthia et al. also noted that the majority of them had low levels of HDL and high TC.[1]

In contrast to hemorrhagic stroke, which is what the current study has shown, ischemic stroke patients had greater levels of TC and lower levels of HDL, according to a study conducted on the Tribal Population of West Bengal.[9] A different study conducted in Karnataka by Nirmala et al. found that stroke patients had lower levels of HDL and VLDL.[10]

The results of the current investigation, which found that the only blood lipid index linked to the occurrence of ischemic stroke is a low level of HDL cholesterol, have been reinforced by an international study conducted on 94 ischemic stroke patients from France.[11] In contrast, Ogunrin et al. found no discernible difference between stroke patients' serum cholesterol, HDL-C,

or low density lipoprotein (LDL) levels and those of the control group; however, they did note that stroke patients had greater levels of TC.[12] The present investigation was limited by its cross-sectional design and small sample size; a large randomized clinical trial is necessary to support the conclusions of this study.

Conclusion

Based on the findings, it can be said that two risk factors for both infarction and hemorrhagic strokes are a lower HDL level and greater TC. Therefore, actions that raise HDL and lower TC may be helpful in lowering events and, ultimately, mortality.

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