Prospective Cross Sectional Study of Incidence and Correlation of Dyslipidemia in Predicting Outcome of Patients Diagnosed with Cerebrovascular Accident

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ABSTRACT

Introduction: Lipid abnormality has been described as one of the risk factor for ischemic stroke. However, there are limited studies comparing stroke pattern (infarction and hemorrhage) with lipid profile of patients. Study aimed to study incidence and correlation of lipid abnormality in cerebrovascular accident (CVA) patients.
Material and Methods: Hundred and twenty seven subjects were studied after dividing in to Cases (n=102, with CVA) and Control (n=25, without CVA) in the Department of Medicine G R Medical College and JA Group of Hospitals, Gwalior between April 2015 to August 2016. Detailed history and lipid profile was recorded for each subject. Stroke pattern was analyzed using brain CT/MRI for each patient.
Results: Most of the subjects among Cases and Control belong to the age groups of 61-85 years (45.09%) followed by 41-60 years (44%) respectively. Among Cases, maximum patients were males (61.76%) whereas among Control, maximum patients were females (84%). Most of the cases were smokers (53.92%). Among smokers of Case group, infarction (55%) was more common compared to hemorrhage (51%). Dyslipidemia was more common among cases (56.86%) compared to control (28%) (p=0.009). Majority of patients (63.07%) with infarct had dyslipidemia as compared to patients with hemorrhage (45.94%). Decreased high density lipoprotein (HDL) level (74%) was the main culprit among Cases followed by decreased total cholesterol (64%). Out of 14 expired patients in Cases, 71.42% had dyslipidemia.
Conclusion: Decreased level of HDL was most commonly reported among ischemic compared to hemorrhagic stroke. Dyslipidemia was most commonly reported in patients who died because of stroke.

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

INTRODUCTION

Cerebrovascular Accident (CVA) or stroke can be defined as rapidly developing symptoms and/or signs of focal and global loss of cerebral function which can last at least for 24 hours with no evident cause other than the vascular origin. According to data published by World Health Organization, stroke is second largest cause of mortality throughout the world.[1]
As per the recent data released by American Heart Association, stroke accounts for nearly 801,000 deaths in the US.[2] Recent studies from Indian population has revealed that age-adjusted prevalence rate of stroke was between 250-350/100,000.[3]
Hypertension and atrial fibrillation are theindependent risk factors in the occurrence of CVA, but data of prognostic role of abnormal lipid profile in Indian population is lacking.[4] Many previous reports have suggested the role of increased total cholesterol (TC) in the development of CVA, but role of TC

along with other lipid parameter in hemorrhagic stroke is not clear.[5,6] Hence, present study was performed to establish the relationship between abnormal lipid profile or dyslipidemia in patients with CVA in Indian population.

MATERIAL AND METHODS

A cross sectional prospective study was done including 102 CVA patients (Cases group) and compared with 25 age and sex matched healthy subjects (Control group, no CVA) in the Department of Medicine G R Medical College and JA Group of Hospital, Gwalior between April 2015 to August 2016.
A Written informed consent from all the patients and Ethical Committee approval was obtained before starting the study.
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 inform consent, preexisting thyroid disorder and patient on thyroxin therapy and pregnancy and postpartum hypothyroidism were excluded from the study.

STATISTICAL ANALYSIS

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

Most common age group among Cases and Control were 61-85 years [46 (45.09%)] and 41-60 years [11 (44%)] respectively. Majority of the patients among Cases were male [63 (61.76%)] whereas in Control groups most of them were female [21 (84%)].
Out of 102 CVA patients, infarction was the most common

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Lipid profile pattern	Infract (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 patients (percentage), NS; not significant, TC; total cholesterol, TG; triglyceride; HDL; high density lipoprotein, p value of <0.05 is considered as significant				
Table-1: Pattern of lipid profile in relation to CVA type				

stroke pattern [65 (63.72%)] followed by hemorrhage [37 (36.27%)]. Out of 55 smokers in Case group, 36 (55%) were of infarcts and 19 (51%) were of hemorrhage, whereas among non smokers (n=47), 29 (61.70%) were of infarcts and 18 (38.29%) were of hemorrhage (p=0.0001).

Dyslipidemia was reported in 58 (56.86%) and 7 (28%) subjects in cases and control groups respectively (p=0.009). Out of 65 infarct cases, 41 (63.07%) had dyslipidemia and among 37 hemorrhage stroke patients, 17 (45.94%) were dyslipidemic (p=0.14).

Decreased HDL level [43 (74%) in cases and 7 (100%) in Control] was the most common pattern of dyslipidemia observed in stroke followed by increase in total serum cholesterol [37(64%) in Case]. Out of 102 strokes patients, 14 (13.72%) expired and among them 10 (71.42%) had dyslipidemia.

DISCUSSION

Ischemic stroke is associated with significant morbidity and mortality and it is one of the four top causes of the death throughout the world. Infarction and ICH are the main reason for CVA.[7] There are multiple causes and risk factors that determine the risk of developing strokes. Abnormal lipid profile is thought to be the one of the risk factor for stroke.[6]

Togha et al enrolled 258 acute stroke patients and reported higher percentage of ischemic stroke compared to hemorrhagic patients, also most of the ischemic stroke patients were reported to have high level of TC.[7] Opposite to that in present study most of the cerebral infarct patients had decreased HDL levels. But reports of Denti et al showed higher concentration of LDL-C (100 mg/dl) level along with low HDL-C levels whichwere associated with higher stroke risk.[8]

Cynthia et al reported that 56% of stroke patients had dyslipidemia, which exactly matches with the present study results. Cynthia et al also highlighted that most of them had high TC and low level of HDL, which is in accordance to present study data.[1]

Study done on Tribal Population of West Bengal concluded that ischemic stroke patients had higher level of TC and lower level of HDL in comparison to haemorrhagic stroke which is what the present study has revealed.[9] Another study by Nirmala et al in Karnataka reported decreased level of HDL and VLDL among stroke patients.[10]

An international study on 94 ischemic stroke patients from France has again strengthen the findings of the present study which reported that low level of HDL cholesterol is the only serum lipid index associated with development of ischemic stroke.[11] Contrary to that Ogunrin et al did not find any significant difference in serum cholesterol, HDL-C and low density lipoprotein (LDL) levels of stroke patients compared to control but they surly reported higher level of TC among stroke patients.[12]

Small sample size and cross sectional nature were the few limitation of present study; a large randomized clinical trial is required to strengthen the present study findings.

CONCLUSION

Based on the results it can be concluded that decreased level of HDL followed by increased TC can be considered as the risk factors for both infarction and hemorrhagic strokes. Hence, measures for increasing HDL and decreasing TC might be useful to reduce events and eventually decreasing mortality.

REFERENCES

1. Cynthia A, Yogeesha KS, Arunachalam R. Dyslipidemia in stroke. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2014;13:45-9.
2. American Heart Association. Heart Disease and Stroke Statistics 2017 At-a-Glance. 2017;1-6.
3. Kumar T, Kumar S. Epidemiology of stroke in India. Neurology Asia. 2006;11:1–4. from: https://www.researchgate.net/publication/268354462_Epidemiology_of_stroke_in_India [accessed May 13, 2017].
4. Sacco R, Benson R, Kargman D. High- Density Lipoprotein Cholesterol and Ischemic Stroke in the Elderly. JAMA. 2001;285:2729-35.
5. Bowman T, Sesso H, Ma J, Kurth T. Cholesterol and the Risk of Ischemic Stroke. Stroke. 2003;34:2930-4.
6. Adibhatla R, Hatcher J. Altered Lipid Metabolism in Brain Injury and Disorders. Subcell Biochem. 2008;49:241-68.
7. Togha M, Gheini MR, Ahmadi B, Khashaiar P, Razeghi S. Lipid profile in cerebrovascular accidents. Ir J neurol. 2011;10:1-4.
8. Denti L, Cecchetti A, Annoni V. The role of lipid profile in determining the risk of ischemic stroke in the elderly: a case/control study. Arch Gerontol Geriatr. 2003;37:51-62.
9. Dan S, Kant M, Dey S, Pal PS, Kusvaha GK, JosephA et al. Comparative Study of Lipid Abnormality in Ischemic and Haemorrhagic Stroke in Tribal Population of west Bengal. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS). 2016;15:36-40.
10. Nirmala A C, Mamatha TN, Priya Shree R, Avinash BH. Study of Lipid Profile in Non Diabetic Stroke in Young. Sch J App Med Sci. 2015;3:1259-65.
11. Albucher JF, FerrieresJ, Ruidavets JB, Guiraud-Chaumeil B, Perret BP, Chollet F. Serum lipids in young patients with ischaemic stroke: a case-control study. J Neurol Neurosurg Psychiatry. 2000;69:29–33.
12. Ogunrin OA, Unuigbe E. Serum Lipids in Patients with Stroke-A Cross-Sectional Case-Control Study. Journal Of The National Medical Association. 2008;100:986-90.