IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Comparison of Carotid artery intima-media thickness in Hypertensive Smokers and Non-Hypertensive Smokers in South Karnataka Population

Girish Mood R,

Assistant professor

Department of Medicine

Dr. B. R. Ambedkar Medical College

Gandhi Nagar, Kadugondana halli,

Bangaluru – 560045, Karnataka.

Abstract

Background: Carotid Intima – Media thickness (CIMT) is an established predictor of cardiovascular disease and stroke. However risk factors such as hypertension associated with CIMT remains unclear among south Indian population, which can be a positive predictor of cardiac and cerebral vascular diseases.

Method: 26 adult patients aged between 30 to 65 years smokers with HTN were compared with Non HTN smokers group (controlled). USG scanning of carotid arteries using WIPRO – Ge logic 400MD scanner with a linear transducer (Mid-frequency range 7.5 – 10 MHZ) and CIMT value > 0.8 was considered suggestive of significant atherosclerosis. BP was recorded along with lipid profile and BMI was also studied and compared among both groups.

Results: Comparison of lipid profile and BMI had a significant P<0.001 value in both groups. Similarly comparison of mean value if CIMT in group was also highly significant (P<0.001)

Conclusion: This study shows that CIMT can be a helpful tool for the clinician or cardiologist to treat such patients efficiently to prevent CVD, and stroke.

Keywords: BMI, CIMT, lipid profile atherosclerosis CVD, Cerebro, Vascular disease, south Karnataka.

Introduction

It is an established fact that, there are serious adverse effects of chronic smoking related increased mortalitythan heavy drinking [(1)]. Smoking has been well documented as a risk factor for ischemic heart disease (IHD) in general. It is also reported that, smoking degrades carotid IMT, a well known marker for atherosclerosis [(2)] lethal changes in lipid profile and other cardio vascular bio-markers, as well as deleterious changes in arterial HTN, peripheral artery disease and atherosclerosis. IHD, ischemic stroke are posing major burdens to the global health [(3)]. Atherosclerosis is an important pathologic process which can result in cardiovascular disease (CVD) as well as cerebral vascular diseases, which are the leading causes of mortality and have significant impacts on morbidity. Therefore, early prevention of cardiac and cerebro vascular disease has become focus for current research in utilising CIMT as a simple non-invasive method in the assessment of sub-clinical atherosclerosis which has been shown to be an independent predictor of CVD and Cerebro vascular risk (4). Carotid Intima, media thickness is a reliable method to detect atherosclerosis (5). Hence measuring carotid artery intima media thickness as a standard diagnostic procedure in assessing CVD risk in our study subjects.

Material and Method

26 (twenty six) adult patients aged between 30 to 65 years regularly visiting Medicine department of Dr. B R Ambedkar Medical College Gandhi Nagar, Kadugondana Halli Bangaluru-5600045 Karnataka and outpatient clinic of the primary investigator were studied.

Inclusive Criteria: Active smokers with Hypertensive (HTN) and not taking anti-hypertensive drugs or irregularly taking HTN drugs were also selected for the study.

Exclusion Criteria: The patients below 20 years, having COPD, pulmonary tuberculosis (PT) type-II DM, Cardio-myopathies, cardio-vascular diseases were excluded from study.

Method: 26 patients with active smoking and HTN were compared with Non-HTN smokers (Controlled group) same number (26).

Each patient underwent ultra-sonographic scanning of carotid arteries using WIPRO-Ge logic 400 MD scanner with a linear transducer (mid frequency range 7.5 – 10 MHz). CIMT value of more than 0.8 mm was suggestive of significant atherosclerosis. Blood examination to assess lipid profileand BMI was also measured. Each patient was also evaluated with complete echocardiography.

Blood pressure was measured by standard mercury spygmo manometer. HTN was classified using JNC 8 guidelines measured at least two consecutive measurements.The duration of study was from June 2016 to 2018

Statistical analysis: The comparison of CIMT (carotid Intima Media thickness Test) and lipid profile was in both groups by t test was carried out statistical analysis was done in SPSS software. The ratio of the male and female was 2:1

Observation and Results

Table-1: Comparison of lipid profile and BMI in both groups cholesterol (mg/d1) – 162.5 (±19.3) in patients and 153.4 (±13.6) in controlled group t test was 1.96 p value ($p<0.001$).

Triglyceride (mg/d1) 126.8 (±34.3) in cases and 114.2 (±20.4) in controlled group t test was $p<0.001$

HDLI 51.2 (±11.7) in cases and 48.7 (±7.8) in controlled t test 0.36 $p<0.0001$

LDL – 113.8 (±22.2) in cases 108 (±14.2) in controlled group t test 32.6 $p<0.002$

BMI 29.2 (±3.1) in cases and 25.2 (±5.2) in controlled group $p<0.00$

Table-2: Comparison of mean values of CIMT in both group CIMT 0.972 (±0.11) in cases, 0.733 (±0.4) in controlled t test 10.4 $p<0.001$ CIMT right side -0.944 (±0.9) in cases 0.722 (±0.2) in controlled t test 1.22 $p<0.001$.

CIMT in left side 0.999 (±0.51) in cases 0.745 (±0.20) in controlled t test 2.36 $p<0.001$

Discussion

The present study of comparison between carotid artery initima media thickness in HTN smokers and Non-HTN smokers in South Karnataka Population – The lipid profile was cholesterol (mg/d1) 162.5 (±19.3) in cases and 153.4 (±13.6) in controlled group t test 1.96 and $p<0.001$. Triglyceride value 126.8 (±34.3) in affected, 114.2 (±20.4) in controlled group t test 1.61 and $p<0.001$ HDL value 51.2 (±11.7) in affected 48.7 (±7.8) in controlled t test was 0.36 $p<0.001$. In LDL value 113.8 (±22.2) in affected 108 (±14.2) in controlled, t test was 32.6 $p<0.001$. BMI was 29.2 (±3.1) in affected group 25.2 (±2.03) t test 5.2 $p<0.000$ (Table-1). Comparison of Mean value of CIMT (±0.11) in affected group, 0.733 in controlled group t test was 10.4 $p<0.00$) CIMT in right side value 0.9444 (0.04) in affected group, 0.722 (±0.21) in controlled t test was 1.22 and $p<0.000$ CMIT left side 0.999 (±0.51) in affected cases, 0.745 (±0.20) in controlled group t test was 2.36 and $p<0.001$ (p value was highly significant) Table-2. These findings are more or less in agreement with previous studies [(6)(7)(8)].

It is reported that vascular remodelling is the cause of carotid arterial changes, although compensatory mechanism, hemodynamic changes occur in walls of arteries resulting arterial disease. It was also observed that, thickness was higher in patients not getting any treatment for HTN or lipid lowering [9]. It was also noted that, higher thickness was observed in the bifurcation spot of common carotid into internal and external carotid artery in the patients softening with HTN, type-II DM and smoking Moreover in Myocardial infarction and stroke too [10].

CIMT can be used as a surrogate marker for cardio-vascular and cerebral-vascular disease as it is an independent predictor atherosclerosis which leads to CVD[11]. Smoking significantly exacerbates the adverse effects of age and metabolic syndrome. Smokers had significant increased atherosclerosis risk.

Summary and Conclusion

The present study has proven that smoking significantly exacerbates the adverse effects like CVD and stroke. However this further demands genetic, patho-physiological, nutritional, angiological, pharmacological, immunological studies as the exact mechanism and factors which cause thickness of carotid walls is still remains un-clear.

Table – 1

Comparison of lipid profile and BMI in both groups

Sl. No	Lipid Profile	Cases 26	Control 26	t test	P Value
1	Cholesterol (mg/dl)	162.5 (±19.3)	153.4 (±3.6)	1.96	P<0.001
2	Triglyceride (mg/dl)	126.8 (±34.3)	114.2 (±20.4)	1.61	P<0.001
3	High density lipoprotein-cholesterol	51.2 (±11.70)	48.7 (±9.8)	0.36	P<0.001
4	Low-density lipoprotein cholesterol LDL	113.8 (±22.2)	108 (±14.2)	32.6	P<0.001
5	Body Mass Index (BMI)	29.2 (±3.1)	25.2 (±2.3)	5.2	P<0.00

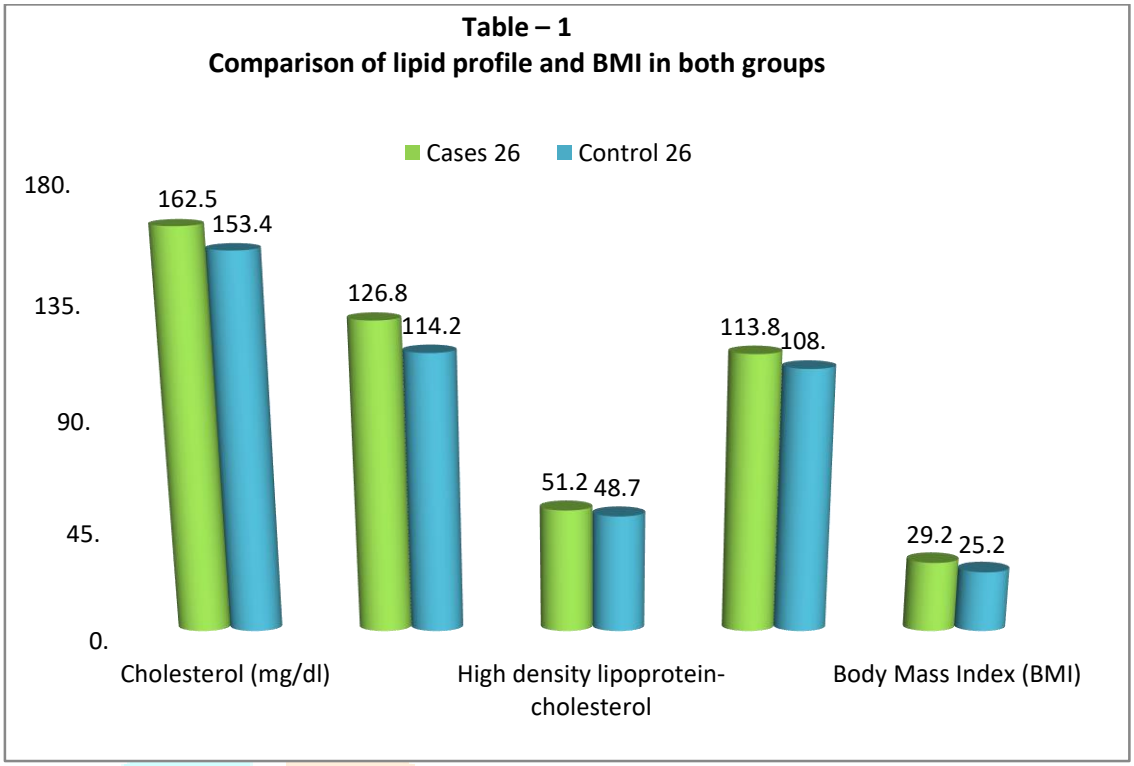
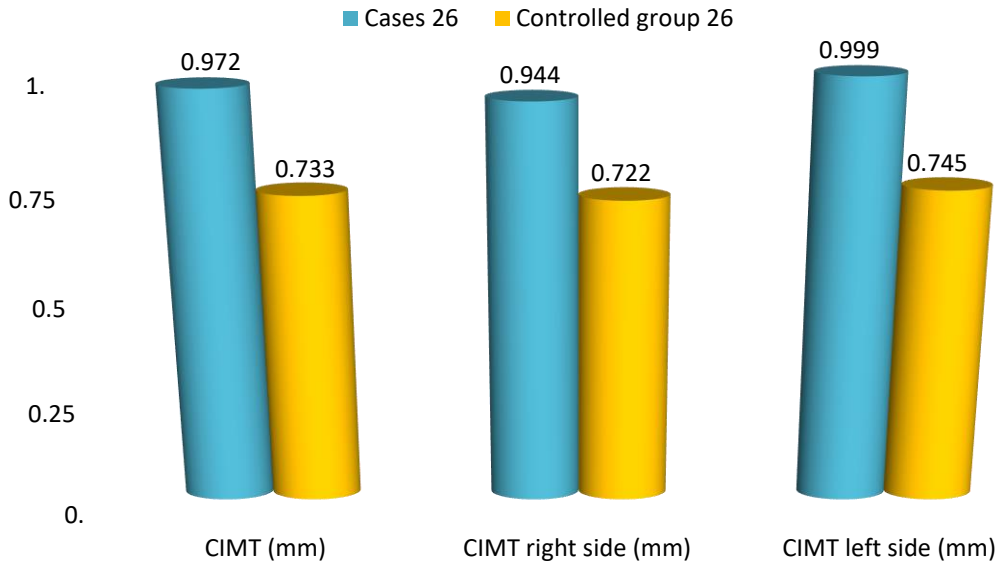


Table – 2

Comparison of Mean values of CIMT (Carotid Intima Media Thickness) test in both groups

Sl. No	CIMT	Cases 26	Controlled group 26	t test	P Value
1	CIMT (mm)	0.972 (±0.11)	0.733 (±0.4)	10.4	P<0.00
2	CIMT right side (mm)	0.944 (±0.9)	0.722 (±0.2)	1.22	P<0.001
3	CIMT left side (mm)	0.999 (±0.51)	0.745 (±0.20)	2.36	P<0.001

Table – 2
Comparison of Mean values of CIMT (Carotid Intima Media Thickness) test in both groups



References

1. Hart CL, Davey Smith G, Gruer L – The combined effect of smoking tobacco and drinking alcohol on cause specific mortality. BMC public health 2010, 10, 789-94.
2. You R, Mc Neil JJ – Risk factors for lacunar infarction syndromes. Neurology 1995, 45, 1483-87.
3. Tell GS, Howard G – Cigarette smoking cesation and extra cranial carotid atherosclerosis JAMA 1989, 261, 1178-80.
4. Loxano R, Naghavi M – global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010. Lancet 2012, 380, 2095-2128.
5. Naghavi M, Libby P – From vulnerable plague to vulnerable patient a call for new definitions and risk assessment strategies, circulation 2003, 108, 1772-78.
6. Onut R, Balane Scu AP Imaging atherosclerosis by carotid intimomedia thickness in vivo how to where in whom? Media (Buchar) 2012, 7, 153-162.
7. Persell SD – Prevalence of resistant hypertension in the united states Hypertension 2011, 57, 1076-80.

8. Jaroch J, Loboz Grudzein K – The relationship of carotid arterial stiffness to left ventricular diastolic dysfunction in untreated Hypertension. Kardiol pol. 2012, 70, 223-31.
9. Su. TC, Chien KL – Age and gender associated determinants of carotid – media thickness – A community based study J. Atheroscler. Thromb 2012, 19, 872-80.
10. Sasaki R, Yamano S – Vascular remodelling of carotid artery in patients with un-treated essential hypertension increases with age. Hypertension Res. 2002, 25, 373-9.
11. Mackinnon AD, Jerrad – Denne P – Rates and determinants of site specific progression of carotid artery intima – media thickness. Stroke 2004, 35, 2150-4.