Estimation of Plasma Lipid Profile among Sudanese Cigarette Smokers

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Abstract:

Background: Tobacco smoking is one of the major modifiable cardiovascular risk factors; nicotine and other toxic substances from tobacco smoke are absorbed through the lungs into the blood stream and are circulated throughout the body these substances narrow or damage the blood vessel walls.

Cigarette smoking is now acknowledged to be one of the leading causes of preventable morbidity and mortality and is one of the largest single preventable causes of ill health in the world.

Cigarette smoking accelerates pathogenesis in different type of cancers such as lung, pancreas, breast, liver and kidney similarly, it also enhances pH in stomach ulcers and gastric disease

Methodology: This is a retrospective case control study To estimation of lipid profile among Sudanese cigarettes smokers in Khartoum state, Study included one hundred (100) healthy men divided in two groups, in group I (smokers) 50 men as case with the difference age group and, 50men were included in group II (non-smokers) as controls of the difference age, Group I was depending upon on smoking number of cigarette per day and duration. Lipid profile was measured for all these groups used enzymatic methods LDL cholesterol was calculated using Friedewald formula.

Conclusion: *The total plasma cholesterol, LDL, and Triglyceride values were higher in smokers as compared to non-smoker; Plasma levels of HDL are lower in smokers than non-smoker.*

Key words: Cigarette Smoking, Coronary Heart Disease, Dyslipidemia, Lipid profile, Tobacco.

INTRODUCTION

Tobacco cigarette smoking is one of the major leading causes of death and essential public health challenge in world over. [1] Smoking has both acute and chronic effect on haematological parameters. There are more than 4000 chemicals found in cigarette smoke.[2] and a cigarette smoker is exposed to number of harmful substances including nicotine, free radicals, carbon monoxide and other gaseous product ,it is widely known that smokers have higher risk for cardiovascular diseases, hypertension, inflammation, stroke, clotting disorder, and respiratory disease. [3] Moreover, cigarette smoking accelerates pathogenesis in different type of cancers such as lung, pancreas, breast, liver and kidney Similarly, it also enhances pH in stomach ulcers and gastric diseases [4] that resulted in Peptic during past decade, it was suggested that cigarette smoking affect the blood characteristics as well that leads to death For example, relation between smoking and white blood cell count. [5]

Smoking is an escalating health problem, especially in developing countries such as India. Cigarette smoking is a known risk factor for peripheral, coronary and cerebral atherosclerotic vascular diseases

WORLD HEALTH ORGANIZATION (WHO) RECORDS:

Approximately one third of world population older than 15years, are consuming tobacco Cigarette smoking is one of the

most extensively used potentially hazardous social habits throughout the world but more extensively prevalent in South East Asia . [6] Tobacco consumption is now increasing rapidly throughout the developing world and is one of the biggest threats to current and future world health the highest prevalence of it is observed in young adult male during their reproductive period between 20 to 39 years. [7] Today tobacco consumption has been established as a number one preventable cause of death and disease in the countries worldwide. About 30-40% of the all the death from cancer are associated with tobacco consumption. Is not only associated with lung cancer but also associated with increased incidence of cancer in larynx, oral, oesophagus, cervix, bladder, pancreas and even leukaemia. [8] Cigarette smoking is considered a major risk factor for coronary heart disease1 .It has also been shown that a decrease of high density lipoprotein (HDL) cholesterol is a risk factor for the same. [9]

There are a number of reports in the literature examining the A study was done by Aski B.S, Kashinath R. T etal in India, 2012 including 25 healthy non-smokers as controls and 75 active smokers between the age group of 20 to 60 years to carry out a comparative study to investigate effect of cigarette smoking on blood Lipid there was a significant increase in levels of cholesterol, triglyceride, LDL-C in almost all the groups of cigarette smokers as compared to non-smokers. Simultaneously a significant reduction in level of HDL-C is observed in cigarette smoker's.

MATERIAL AND METHOD

This is a retrospective case control study based on data collected by Questionnaire and Interviews:

Interviews with a test group and the control group will be done to obtain the clinical data, Questionnaire designed specifically to obtain information (age, sex, duration of smoker,

drug, diabetic complications,) which help in either including or excluding certain individuals in or from the study They were conducted in Khartoum state.

And the study was approved by the University of Medical Science and technology Ethics Committee. All human studies have been approved by the Research Ethics Committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki. The study populations were comprising 100 male which are divided into two groups: 50 healthy non-smokers as controls and 50 healthy smokers as case.

Data was analysed using the Statistical Package for the Social Sciences (SPSS)(www.SPSS.com). Values are expressed as mean. Semen profiles data from controls and diabetic men were compared using Student's t-test.

The level *p<0.05* was considered as the cut off value for significance.

RESULTS

Table 1 Mean and Std. Deviation of T.Cholesterol, T.G, HDL, LDL, number of cigarettes and duration for case and control.

	Mean	Std. Deviation
Cholesterol mg/dl	180.86	23.447
Triglyceride mg/dl	125.14	36.528
Cases (n)		
HDL mg/dl	40.84	7.582
LDL-c mg/dl	114.992	24.9279
Age (years)	31.44	11.348
Number of cigarettes	9.74	7.306
Duration (years)	7.16	8.9679
Cholesterol	130.32	21.636
Triglyceride	106.1	18.673
Control (n)		
HDL	61.98	16.588
LDL	47.12	21.4379

Table 2 Comparison between result of case and control

		Mean	Std. Deviation	P value
Cholesterol mg/dl	Case	180.86	23.447	0.000
	Control	130.32	21.636	
Triglyceride mg/dl	Case	125.14	36.528	0.001
	Control	106.1	18.673	
HDL mg/dl	Case	40.84	7.582	0.000
	Control	61.98	16.588	
LDL-c mg/dl	Case	114.992	24.9279	0.000
	Control	47.12	21.4379	

Table 3 Correlation between number of cigarette and duration of smoking with lipid profile

	Pearson Correlation	P value	Comment
Cholesterol	0.244	0.088	Insignificant
Triglyceride	0.430	0.002	Significant Positive
(Number of cigarettes per days)			
HDL	-0.598	0.000	Significant Negative
LDL	0.285	0.045	Significant Positive
Cholesterol	0.542	0.000	Significant Positive
Triglyceride	0.372	0.008	Significant Positive
(Duration (years)			
HDL	-0.494	0.000	Significant Negative
LDL	0.551	0.000	Significant Positive

There was a significant difference in lipid profile between patient and control (p<0.05).
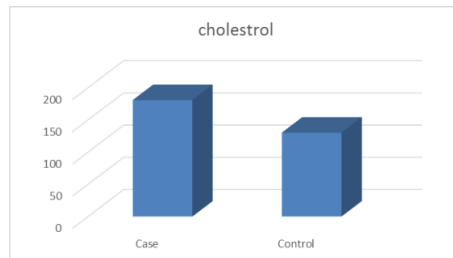

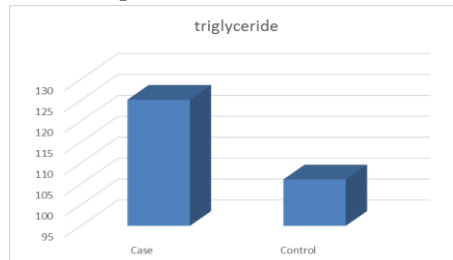**Figure (1) shows Mean plasma cholesterol level in case &controls**

Figure (2) shows Mean plasma triglyceride levels in case &controls
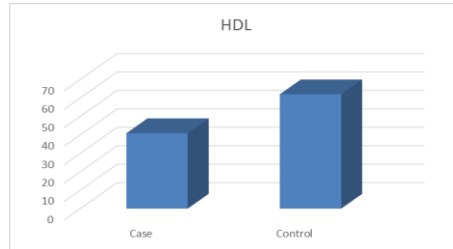
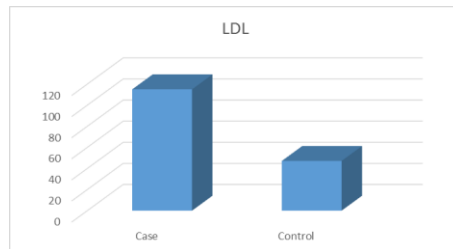**Figure (3) shows Mean plasma HDL-C levels in case &controls**

Figure (4) shows Mean plasma LDL-C level in case &controls

DISCUSSION:

Cigarette smoking is one of the commonest causes of mortality in men it is responsible for the death of millions of people every year, is so widespread that it has become a genuine problem for public health.

This study shows that the mean of total cholesterol in smoking was higher than that of the non-smoking group and this is statistically significant (p=0.000) which agree with the studies done by Aski B.S, Kashinath R. T etal. (10) Other studies by Elhashimi etal. (11)

This study also demonstrates that higher values (p=0.001) of TG were found in smoking subject. This is consistent with the study done by Dr. Anil Batas. (12)

Our study also reveals that the smoking groups have significantly higher LDL-C (p=0.000) than non-smoking individual. That agrees with the finding seen in the study by Imran Khana etal. (36)

The study also shows that the mean total HDL-C in smokers group was decreased than that of the non-smokers group and statistically significant (p=0.000) which agree with the studies done by Aski B.S, Kashinath R. T etal. (10) Study of Elhashimi etal. (11)

Increased cholesterol levels and CHD are observed in cigarette smokers.(38)Higher level of cholesterol is associated with CHD Cigarette smoking substantially increases the risk of coronary heart disease and ischaemic stroke, nicotine causes increase in cholesterol levels.

Epidemiological studies have shown that long-term morbidity and mortality in coronary heart disease (CHD), manifest over years, is directly related to circulating levels of atherogenic lipoproteins, in particular LDL-C.(13) Various mechanisms leading to lipid alteration by smoking are: (a) nicotine stimulates sympathetic adrenal system leading to increase secretion of catecholamines resulting in increased lipolysis and increased concentration of plasma free fatty acids (FFA) which further result in increased secretion of hepatic FFAs and hepatic triglycerides along with VLDL- C in the blood stream. (14) (B) fall in oestrogen levels occurs due to smoking which further leads to decreased HDL – cholesterol. (15) (c) Presence of hyperinsulinaemia in smokers leads to increased cholesterol, LDL-C, VLDL-C, and TG due to decreased activity of lipoprotein lipase. (16) to be infertile compared to men younger than 25 years. It was reported in a study, that the frequency of diabetic with infertility was increasing with increasing age. But in this study, the frequency of infertility declined after 45 years.

CONCLUSION

These findings suggest that smoking might be related in the alteration in lipid profile adversely causing dyslipidaemia in smokers and the changes become more marked with increased

duration / Years and number of cigarette/day smoked. Smoking plays the key role for atherosclerotic process and with coronary artery disease

RECOMMENDATIONS:

It is strongly recommended to avoid smoking for the benefit of cardiac health. It is important to establish a visible and audible communication aids and through schools and colleges explaining risks of smoking on the cardiovascular system and other systems.   If the not impossible other study includes female.

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