



A STUDY OF LIPID PROFILE IN SMOKERS IN TERTIARY CARE HOSPITAL

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KEYWORDS :

INTRODUCTION

Cigarette smoking is one of the major risk factors in coronary heart disease. Smoking is a common preventable and treatable cause for the coronary artery disease. Several mechanisms have been suggested to explain the harmful effects of cigarette smoking on cardiovascular disease. Cigarette smokers have a higher risk of coronary artery disease than non-smokers. Several possible explanations have been offered for this association, including altered blood coagulation, impaired integrity of the arterial wall, and changes in blood lipid and lipoprotein concentrations¹.

Sudden death is 2-4 times more often in heavy smokers than in non smokers and smoking more than 10 cigarettes on regular basis constitutes a major risk factor for ischaemic heart disease. Those who continue to smoke have twice as many fatal and non fatal events as compared to those who do not smoke².

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. Cigarette smoking leads to the uptake of many hazardous compounds and their metabolites extracted from burning tobacco³.

These substances may be electrophilic and react with biological molecules, and give rise to oxidative stress through the formation of reactive species or the initiation of lipid peroxidation chain reactions in the membranes⁴.

Plasma lipoprotein abnormalities are major risk factor for the occurrence of atherosclerotic vascular disease⁵. The prevalence of smoking in India varies from about 15% to over 50% among men⁶. However, smoking is less common among women with prevalence of 4% or less⁷. Cigarette smoking has been found to alter the lipoprotein levels⁸.

In several comparative studies of smokers and non-smokers, smokers have had significantly lower high-density lipoprotein concentrations, measured as high-density lipoprotein cholesterol; in some studies, moderately raised low-density lipoprotein concentrations have also been found.

AIMS AND OBJECTIVES:

This study intends to evaluate the most common lipid profile abnormalities in smokers. The study helps to early detection of lipid abnormalities and aims to educate in smoking cessation and reducing chance of developing coronary artery disease, peripheral arterial disease and cerebrovascular accident.

METHODOLOGY:

The present study is a prospective observational study conducted in tertiary care Government General Hospital, Kurnool, Andhra Pradesh for six months from November 2020 to April 2021. 34 patients were enrolled in the study who were evaluated under department of General Medicine with smoking habit after considering the inclusion and exclusion criteria. Informed consent was taken before enrolment.

RESULTS:

The smoking is a important risk factor for coronary artery disease,

peripheral artery disease and cerebrovascular accident. Dyslipidemia seen in all cases. Mean LDL cholesterol 158.22mg/dL in 18-26yrs, mean LDL cholesterol of 189.41mg/dL in smokers aged 30-55 yrs having, mean LDL cholesterol 204.4 mg/dL among smokers aged 57-60 yrs.

CONCLUSION:

Excess smoking and long duration of smoking causing lipid abnormalities. In this study we confirmed raised LDL levels and decreased HDL levels in smokers which is more atherogenic causing coronary artery disease, peripheral vascular disease and cerebrovascular accident. A better understanding of smoking and lipid abnormalities could lead to better primary prevention and secondary prevention of various cardiovascular, cerebrovascular and peripheral vascular disorders.

Inclusion Criteria

- Male
- Smoker aged 18-60 yrs
- Not a DM & HTN
- NonAlcoholic

Exclusion Criteria

- Females
- Aged <18 - >60 yrs
- DM, HTN, Alcoholic

Data Collection

A study of 34 patients presenting in Govt. General Hospital, Kurnool, OPD/IP services. All the subjects were interviewed and complete history was taken along with thorough clinical examination was done according to proforma that was predesigned. Informed consent was secured from the patients for participation in the study. Patients were investigated for Lipid profile. Haemogram and other routine investigations were done. For the study taken 34 male patients non DM, non HTN age in between 18-60 yrs.

Age Distribution:

The mean age of patients in the present study is 40.14 yrs. The majority of them are in the age group of 30-50 years. The youngest being 18 years and the oldest being 60 years.

DISCUSSION

Various studies previously demonstrated a rise in TC, TGL, LDL and a fall in HDL in smokers. It has been suggested that smoking, even of short duration and moderate consumption of cigarettes, is associated with adverse lipoprotein profiles. Similar observation in lipid profile, such as rise in TC, TGL and LDL and fall in HDL were noted among passive smokers.

In this context, the mechanisms for the altered lipid profile among smokers were recalled⁹.

- i. Nicotine stimulates the release of adrenaline from the adrenal cortex leading to increased serum concentration of free fatty acids (FFA) which further stimulates hepatic synthesis and secretion of cholesterol⁹ as well as hepatic secretion of very low density lipoprotein (VLDL) and hence increased TGL¹⁰.
- ii. Smoking decreases estrogen levels and further leads to decreased HDL cholesterol concentration^{11,12}. Also, HDL concentration was inversely related to VLDL concentration in serum.

iii. Smoking increases insulin resistance and thus, causes hyperinsulinemia. LDL, VLDL and TGL are elevated in hyperinsulinemic conditions due to decreased activity of lipoprotein lipase¹².

S. No	Age	Total cholesterol	HDL	Triglycerides	LDL	VLDL
1	18	206	30	83	159.4	17
2	20	167	18	92	130.6	18
3	21	214	24	114	167.2	23
4	21	189	22	154	136.2	31
5	21	211	26	134	158.2	27
6	22	267	18	148	219.4	30
7	26	188	12	105	155	21
8	26	186	15	156	139.8	31
9	30	159	18	134	114.2	27
10	30	198	22	187	138.6	37
11	31	209	32	144	148.2	29
12	32	218	26	111	169.8	22
13	34	228	32	132	169.6	26
14	35	248	16	102	211.6	20
15	38	231	36	122	170.6	24
16	39	280	18	135	235	27
17	41	245	28	148	187.4	30
18	42	304	22	158	250.4	32
19	43	208	28	168	146.4	34
20	44	266	16	111	227.8	22
21	48	243	18	113	202.4	23
22	44	237	24	122	188.6	24
23	48	315	22	157	261.6	31
24	49	278	28	124	225.2	25
25	50	301	30	144	242.2	29
26	51	242	32	94	191.2	19
27	52	198	12	116	162.8	23
28	55	176	10	107	144.6	21
29	57	308	30	178	142.4	36
30	58	267	18	122	224.6	24
31	59	230	32	198	158	40
32	60	254	22	132	205.6	26
33	60	314	24	156	258.8	31
34	60	294	28	145	237	29

In our study 23.5% of patients having age of 18-26 yrs, 32-55 yrs of patients is 58.8% remaining 57-60 yrs age patients are 17.64%. Among 34 smokers 18-26 yrs mean total cholesterol 203.5mg/dL, smokers aged 30-55 yrs having mean total cholesterol of 239.2mg/dL, smokers aged 57-60 yrs having mean total cholesterol 277.8mg/dL.

Among 34 smokers 18-26 yrs mean HDL cholesterol 20.62mg/dL, smokers aged 30-55 yrs having mean HDL cholesterol of 23.5mg/dL, smokers aged 57-60 yrs having mean HDL cholesterol 25.66 mg/dL.

Among 34 smokers 18-26 yrs mean LDL cholesterol 158.22mg/dL, smokers aged 30-55 yrs having mean LDL cholesterol of 189.41mg/dL, smokers aged 57-60 yrs having mean LDL cholesterol 204.4 mg/dL.

In lipid profile high LDL cholesterol and low HDL cholesterol levels is directly proportional to atheromatus coronary artery disease and peripheral arterial disease. In our study LDL levels are elevated above 100 mg/dL has 18-26 yrs smokers having mean LDL 158.22mg/dL, 30-55 yrs having mean LDL cholesterol of 189.41 mg/dL and 57-60 yrs having mean LDL cholesterol 204.4mg/dL which is very high and directly proportional to atheromatus coronary artery disease and peripheral arterial disease.

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