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EFFECT OF PASSIVE SMOKING ON LIPID LEVELS IN HEALTHY FEMALES - A RETROSPECTIVE ANALYSIS

General Medicine

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ABSTRACT

Background & Objectives: A retrospective study was performed to study the effects of passive smoking on the lipid levels of a healthy female. **Materials and Methods:** A retrospective case record based study was carried out amongst the healthy female attenders attending outpatient department for regular medical health check-up. A total of 200 women fit the inclusion criteria. They were divided into two groups- A (case- at least one family member that smokes) and B (control non-smoking family members). The women in group were divided into three groups based on the number of cigarettes smoked by the family member. The lipid profile of the healthy women was then analysed. **Results:** significant rise in the total cholesterol, LDL, TG and VLDL was noted. There was a statistically significant reduction in HDL levels. This was also found to be directly proportional to the number of cigarettes smoked per day. **Conclusion:** Passive smoking is atherogenic in nature and can cause significant derangement in the lipid levels in otherwise healthy women.

KEYWORDS

TC-Total Cholesterol, TG-Triglycerides, LDL-Low density lipoprotein, HDL- High density Lipoprotein, VLDL- Very low density Lipoprotein

INTRODUCTION:

Several epidemiological studies have been performed to study the effect of passive/second-hand smoking on the general population, as early as the 1960s[1,3]. Over the years, this term has been gradually replaced with "environmental tobacco smoke (ETS)[4,5]. Hence, passive smoking is considered an involuntary exposure to ETS. The effects of passive smoking on general health continue to elude us.

It is of the concern that passive smokers may suffer the same insults as smokers, especially with a prolonged exposure[14]. This is due to the reduced oxygen carrying capacity of the blood, which reduced the oxygen supply to the heart. Since there is an established supply-demand mismatch, there is reduced ATP production by the myocardium, causing reduced exercise tolerance, intimal damage, ultimately ending in an atheroma formation.

Exposure to ETS reduces the blood's ability to carry oxygen to the heart and compromises the ability of the myocardium to produce ATP using oxygen. These effects manifest as reduced exercise capacity in people exposed to ETS. Passive smoking also aggravates the risk of other lifestyle disorders such as diabetes and hypertension. Smokers have several derangements in their lipid levels as well as lipoprotein distribution changes, which is a well-known fact. Despite the existing literature on the effects of smoking, there aren't any studies to evaluate the risks of passive smoking on lipid profile of healthy individuals. Here, we conducted a retrospective study to evaluate the effect of smoking on lipid profiles of healthy reproductive women.

METHODS AND MATERIALS:

The present study is a retrospective observational study conducted in the department of Medicine between April 2022 and August 2022. 100 reproductive women that don't have a history of smoking, between the ages of 18-40, but had at least one family member with the history of smoking, were included in the study (group A). 100 women that don't have any family members that simple were considered as the control group (group B) The women were those patients that came for regular health check-ups to the outpatient department, and details were taken retrospectively from the case records.

A semi-structured pro forma was designed for recording the demographic data, clinical history, history of co-morbidities and history of drug abuse. Apart from exposure to smoking at home, exposure at workplace also was recorded. Emphasis was laid on the duration of exposure, which was divided into two groups- less than 5 years and more than 5 years. Women that use any form of tobacco were excluded from the study. Patient's basic parameters were recorded, and the values of the lipid profile test was entered.

Statistics:

The data was recorded in an MS Excel word sheet. The data was represented as mean, median and IQR were considered necessary. Student's T test was performed. A p value less than 0.05 was considered statistically significant.

RESULTS:

The lipid profile obtained from 200 subjects, among whom 100 were passive smokers (cases) and 100 non-smokers (controls) was analysed.

Distribution of cases and controls in relation to age-group

Table 1: Distribution of cases and controls in relation to age Age (years)

Age group	Group A	Group B
18-30	72	66
30-40	28	34

The mean Total Cholesterol value in subjects not exposed to ETS (controls) was 164.03 ± 27.67 mg/dl, whereas the total cholesterol in women exposed to ETS was 191.94 ± 32.32 mg/dl. The difference was found to be statistically significant. (p=0.011*).

The mean LDL Cholesterol in non-smokers was 102.32 ± 32.20 mg/dl whereas the LDL cholesterol in passive smokers was 123.37 ± 35.67, which was statistically significant.(p=0.009*)

The mean HDL cholesterol in non-smokers was 42 +/- 8.3 whereas in passive smokers the mean HDLC was 46.98 ± 7.40 (p=0.048, statistically significant).

The mean triglycerides in non-smoking women was 119.74± 29.56 whereas the mean triglycerides in passive smokers was 126.1±28.54 (p=0.275, statistically not significant).

DISCUSSION:

Passive smoking is nearly as dangerous as actively smoking, and thereby putting those individuals at risks of the same cardiovascular insults as that of smoker. Acute exposure of a non-smoking subject to passive smoking resulted in deterioration of serum oxidant defence, accelerated lipid peroxidation and accumulation of LDL cholesterol in human macrophages. These events were observed even after a very short period (30 minutes) of passive smoking. Indeed it has previously been suggested that the cardiovascular system is extremely sensitive to the chemicals in environmental tobacco smoke. Further the oxidative stress induced by second hand smoke may have more prominent effects on a non-smoking subject than an active smoker whose cardiovascular system has adapted to cigarette smoke[6,7].

ML Holay et al (2004) have demonstrated that mean cholesterol level is higher in passive smokers (169 ± 27.6 mg/dl) than in non-smokers (151.6 ± 13 mg/dl). In the study conducted by Feldman et al (1991) in adolescents, it was found that the ratio of total cholesterol to HDL cholesterol was 8.9% greater in passive smokers than in non-smokers. These results suggest that passive smoking like active smoking leads to alteration in lipid profile predictive of an increased risk of atherosclerosis.[15]

In a study conducted by Valkonen M et al who observed that mean LDL cholesterol in passive smokers was 110.33±27.6mg/dl and in non-smokers was 93.54±26.23 mg/dl. MP Holay al (2004) observed high mean LDL levels (106±20.4mg/dl) in passive smokers than in non-smokers (97.26±15.5mg/dL

In a study done by Neufeld et al (1997) who found out that the mean HDL Cholesterol levels in children from households with cigarette smokers were lower (38.7±1.2mg/dl) than in controls (43.6±mg/dl). In the study conducted by MP Holay et al (2004) the HDL Cholesterol level was 51.48±6mg/dl in passive smokers and 55.24±6.7mg/dl in non-smokers.[16]

CONCLUSION:

Passive smoking has significant derangement in lipid levels in otherwise healthy reproductive women. However, prospective studies are required to better study the effect of the same.

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