

Study on Effect of Cigarette Smoking on Haemoglobin and Blood Lipid Profile in Males in Brack Alshati, Libya

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Abstract: Smoking in different forms is considered as a chief hazard factor for atherosclerosis, coronary heart sickness and peripheral vascular disorders. The aim of this study was to evaluate the effect of cigarette smoking on lipid profiles and haemoglobin levels in adult males smokers compared with non-smokers. This study was performed on 60 subjects from which 30 were smokers and 30 non smokers they were used as (controls). Mean serum lipid profiles and haemoglobin levels were measured in smokers and non-smokers. The level of haemoglobin for the smoker was significantly decreased compared with that of non-smokers ($p < 0.05$) whereas the CHOL, LDL, HDL levels for the smoker were significantly deferent when compared with the controls ($p < 0.05$) and TG was not significantly deferent ($p > 0.05$) compared with the control. There were effect of cigarette smoking on haemoglobin and serum lipids (CHOL, LDL, HDL) and there was no effect of cigarette smoking on the TG level on smokers.

Key words: Cigarette, smoking, lipid, profile, TG, LDL, HDL, haemoglobin

INTRODUCTION

Smoking in different formulas is considered as a chief hazard factor for atherosclerosis, coronary heart sickness and peripheral vascular disorders (Wilhelmsen, 1988; McGill, 1988; Rastogi *et al.*, 1989). Apart from active smokers, passive-smokers are also, prone for the development of smoking related disorders (McGill, 1988). Cigarette smoking is approved as one of the leading causes of preventable morbidity and mortality and one of the largest preventable causes of ill health in the world. Cigarette smoking is said to be responsible for 17-30% of all deaths from cardiovascular diseases. Cigarette smoking is generally considered as associated with increased risk of a variety of medical disorders. Several studies provide the evidence that tobacco is strongly associated with altering the normal status of the lipid profile (Cuesta *et al.*, 1989; Guedes *et al.*, 2007; Arslan *et al.*, 2008). In spite of all that information there is still much controversy about which part or parts in the lipid profile are mainly altered in response to cigarette smoking and whether those lipid profile components influence other parts directly or indirectly and vice versa (Alharbi, 2011). Smoking was a major risk factor for atherosclerotic Cerebro and Cardiovascular Diseases (CVD) through leading to dyslipidemia. Dyslipidemia was the presence of abnormal

levels of lipids in the blood, characterized by an elevation of the concentration of Total Cholesterol (TC) Low-Density Lipoprotein (LDL) and Triglycerides (TG) and a decrease in High Density Lipoprotein cholesterol (HDL) (Craig *et al.*, 1989; Wang *et al.*, 2011). A comprehensive analysis, examined published data from 1966-1987 and estimated the excess risk posed by smoking on CVD with particular emphasis on lipid and lipoprotein involvement, the results of the analysis indicated that compared with non-smokers, cigarettes smokers had significantly higher TC (3) TG (9.1) and LDL (10.4%) higher (but not significant LDL (1.7%) and lower concentrations of HDL (-5.7%) (Craig *et al.*, 1989). Many physiologic benefits were associated with smoking cessation, including normalization of the lipid and lipoprotein profile. A meta-analysis suggested that with smoking cessation an individual could experience an increase in HDL but other lipid and lipoproteins (TC, LDL and TG) remained unchanged, Movement toward normalization of HDL could be seen in as little as 17 days and would continue to progress toward normal (non-smoking) levels as long as cessation continues (Maeda *et al.*, 2003). The aim of this study was to evaluate the effect of cigarette smoking on lipid profiles and haemoglobin levels in adult male smokers compared with that of non-smokers.

MATERIALS AND METHODS

The present research comprised 2 groups of subjects. These subjects (cigarette smokers and non-smokers) were resident in Al-Shati Region, the first groups include 30 smokers and the second groups include 30 non-smokers male subjects. Their age range was (18-60) years. The range of cigarettes smoking by those smokers were from 10-20 cigarettes/days, patients who suffering from diseases during the study period were excluded. Diabetics, hypertensive and those with history of angina also were not included in the study. This study was performed in the period extended from April-October 2016.

Blood samples were collected from all contributors, the sample was divided into 2 container, one without anticoagulant and the other with anticoagulant. Serum was separated from the blood samples by centrifugation of the blood samples at 3000 round/min for 10 min and the serum samples were kept at -20°C until used. The analysis of lipid profile (CHOL, TG, LDL, HDL) were performed by using spectrophotometer (Model 1990) manufactured by great Britain and the haemoglobin analysis was performed according to the standard methods as in the sheet enclosed with the kit (Tietz, 1976). Minitab and Excel Programs Version 11 were used for statistical analysis and graphic presentation. The paired t-test and ANOVA were used to compare between the patients and control, $p < 0.05$ were considered as significant. Serum haemoglobin in both smokers and non-smokers, the level of haemoglobin for the smoker was significantly decreased when compared with that of non-smokers ($p < 0.05$).

RESULTS AND DISCUSSION

Table 1 showing lipid profile and haemoglobin levels (Mean±SD) in smokers in comparison to non-smokers Table 1 and Fig. 1, 2 shows the mean±SD levels of serum haemoglobin in both smokers and non-smokers the level of haemoglobin for the smoker was significantly decreased when compared with that of non-smokers ($p < 0.05$). The TG levels for both smokers and non-smokers were within normal range and were not significantly deferent ($p > 0.05$) whereas the CHOL levels significantly deferent ($p < 0.05$). The levels of HDL and LDL were both significantly deferent ($p < 0.05$) the LDL were significantly higher while mean level of serum HDL were significantly lower in cases when compared with controls.

Tobacco smoking has been associated to cause several major morphological and biochemical problems in individuals. Tobacco cigarette smoking is one of the main causes of death and crucial public health challenge in world over (Kume *et al.*, 2009; Islam *et al.*, 2007; Green and Rogdman, 1996). Smoking has both acute

Table 1: Lipid profile and hemoglobin (Mean±SD) in smokers in comparison to non-smokers

Parameters	Non-smokers n (30) (Mean±SD)	Smokers n (30) (Mean±SD)	p.values
HB (g/dL)	15.37±0.64	12.82±2.71	0.000
TG (mg/dL)	123.50±58.42	108.67±67.47	0.369
CHOL (mg/dL)	134.83±34.26	174.63±66.41	0.011
HDL (mg/dL)	36.79±6.55	23.26±9.76	0.000
LDL (mg/dL)	71.44±37.00	131.98±62.34	0.000

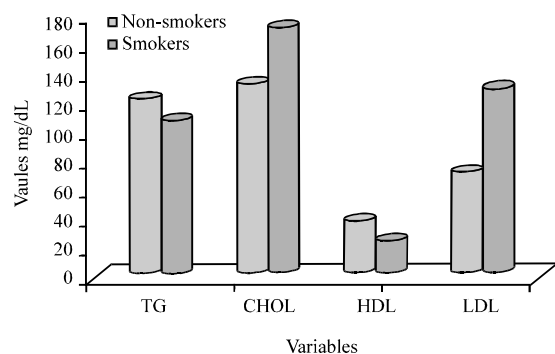


Fig. 1: Lipids profile in smokers and non-smokers healthy males

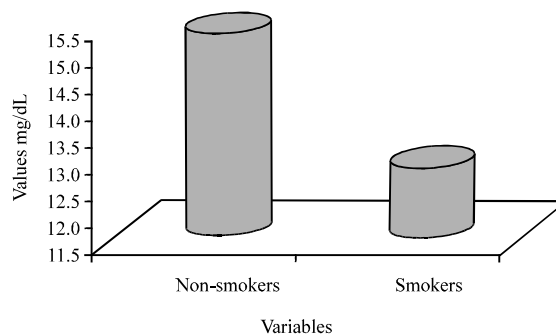


Fig. 2: Heamoglobin in smokers and non-smokers healthy males

important and chronic impact on haematological parameters. There are more than 4000 chemicals found in cigarette smoke (Asif *et al.*, 2013) and a cigarette smoker is exposed to a number of harmful compounds including nicotine, free radicals, carbon monoxide and other gaseous products (Gitte, 2011). In this study the haemoglobin levels were significantly deferent whereas the level of haemoglobin decreased as compared with that of control in spite of that the result was within the normal range this result was disagree with that of Nadia *et al.* (2015) were the haemoglobin significantly higher in cigarette smokers than that of non-smokers.

In this study there was not significant change in TG in smokers and non-smokers. However, other researchers reported, Khurana *et al.* (2000) and Ch (2013) observed a rise in the level of TG. The CHOL in smokers was significant increased compared with that of non-smokers

this finding was consistent with that of Khurana *et al.* (2000) and Ch (2013) who observe a rise in the levels of total cholesterol. The level of HDL in smokers was significantly decreased compared with that of non-smokers this finding was in agreement with that of Sonagra *et al.* (2017). The level of LDL were increased in smokers as compared with that of non-smokers this result was in accordance with that of Sonagra *et al.* (2017).

CONCLUSION

There were effect of cigarette smoking on haemoglobin and serum lipids (CHOL, LDL, HDL) and there was no effect of cigarette smoking on the TG level on smokers the effect of cigarette smoking on metabolism of HDL and LDL may be of great value for predication of cardiovascular risk for a wide range of cholesterol concentrations.

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