Association of Lipid Profiles, Body Mass Index and ABO Blood Groups among Iraqi Male Smokers and Non-Smokers

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ABSTRACT

This short study enclosed a male category of Iraqis (343) divided into 2 groups one group contain smokers males (183) who smoke over twenty cigarettes per day and group of non-smokers males (160), the mean age groups was (41 years), the predominant blood groups was O+ and B+, for each groups. The results of this study revealed statistically highly significant differences within the group of smokers ' body mass levels and blood lipid levels in distinction to those of the non-smokers with a propensity to have obesity within the category of smokers relative to the group of non-smokers, so blood lipid concentrations were higher in total cholesterol, triglycerides and LDL cholesterol rate in the smoker's community, and the HDL rate was lower. Whereas the body mass index for this study was a statistically highly significant regression towards the high proportion of obesity with high concentration levels of total cholesterol, triglycerides and low-density fats and a drop in high-density fat concentration levels.

Keywords: Lipid profiles, body mass index (BMI), ABO blood groups, smokers.

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INTRODUCTION

One of the risk factors for coronary heart disease (CHD) is high level of lipids and lipoprotein. High levels of total serum cholesterol (TC), triglycerides (TG), LDL, VLDL, low HDL and increased BMI are strongly associated with CHD (Rizvi *et al,* 2014). BMI is directly proportional to total cholesterol, LDL and triglyceride, but in contrast to HDL cholesterol. Body Mass Index (BMI) easily measures overweight and obesity (Humayun *et al*, 2009). Smoking cigarettes is generally considered to be associated with increased risk of a variety of medical conditions. Several studies show that smoking is strongly associated with modifying the lipid profile's normal status. Tobacco smoke, nicotine and other toxic substances are absorbed into the bloodstream through the lungs and circulated throughout the body. Such chemicals are harmful to the walls of the blood vessels, which cause plaques to form quicker than non-smokers (Elhashimi *et al,* 2013). However toxic ingredients circulate throughout the body in various ways, causing damage. The burning of tobacco and paper is responsible for over 4,000 chemical compounds in the form of carbon monoxide, hydrogen cyanide, phenol, ammonia, formaldehyde, pyrene, nitrosamine, nicotine, tar and other pollutants. Smoking has been known for a rise in the production of haemoglobin (Hb), which is assumed to be mediated by carbon monoxide exposure. Carbon monoxide binds to HB as carboy haemoglobin, which is an inactive type of haemoglobin which carries no oxygen. Carboy haemoglobin frequently moves the Hb dissociation curve to the left side, thereby decreasing Hb's capacity to supply the tissue with oxygen. Smokers retain an increased level of haemoglobin than non-smokers to compensate for the reduced oxygen supply capacity (Shah *et al, 2012*; Okada *et al, 2013*).

In a study, the association of blood group and lipids in adults, Iraqi male smokers and non-smokers appear to be strongly correlated with ABO groups in terms of dyslipidemia (Haithem *et al*, 2017). The elevated levels of blood lipids, marked by higher total cholesterol (TC), low-density lipoprotein (LDL), and triglycerides (TG) levels and a decrease in high-density lipoprotein cholesterol (HDL) were shown to have dyslipidemia. Smoking was a primary risk factor in the dyslipidemia of atherosclerosis and cardiovascular disorders (CVD). Craig et al. Updated with a detailed meta-analysis published 1966 to 1987 information that evaluated the over-risk of cigarette smoking, especially

the role of lipid and lipoprotein. The findings of their study indicate that, compared to non-smokers, the TC (3%), TG (9.1%) and LDL (10.4%), higher (but not significant LDL (1.7%) and lower HDL (-5.7%) levels are significantly higher than those of non-smokers. Relationship between the number of smoked cigarettes and the increase in lipid or lipoprotein parameters are identified in the meta-analysis. The results showed that the smoking dose increased significantly (percentage) from none to heavy: TC (0.0 + 0.8, + 4.3 and + 4.5%), TGs (0, +10.7 and 11.5%) LDL (0, −1.1, 1.4 and + 11.5%). Dose-related reductions in HDL (0, −4.6, -6.3, −8.9%) have also been reported (Zhang Yan-Ling *et al,* 2007). Different physiological effects, including the normalization of lipid and lipoprotein profiles, have been linked with cigarettes cease. Maeda et al. meta-analysis. Suggests that an adult will experience an increase in HDL with the cessation of cigarettes, but remains unchanged in other lipids and lipoproteins (TC, LDL and TG). In just 17 days, the trend towards normalization of HDL will continue to progress to a normal level (non- smoking) until the cessation continues. These findings have significant implications because they alter HDL, TC, HDL and LDL percentages and can facilitate the clearance of circulatory cholesterol (Maeda *eta,* 2019). There was sufficient evidence to confirm a correlation between hyperlipidemia and cigarettes, smoking or smoking cessation. In China, smoking rates were high, especially among the elderly, and several million elderly people in China die from smoking-related conditions and dyslipidemic diseases. Smoking and dyslipidemia synergy to speed up death. Nevertheless, the general population was evidence that dyslipidemia was associated with smoking habits. So whether the relationship existed in long-lasting subjects was still unclear (Lee *et al,*2011; Tseng *et al,* 2010; Onat *et al,* 2009; Tan *et al,*2008).

However many studies demonstrated that there is a direct connection between increasing BMI and higher TC, LDL-C and TG and an inversion of HDL-C interaction. This association between BMI and LDL-C levels has been reported to be a major contributing risk factor in an obese person for cardiovascular diseases. However, there is no conclusion to the expected lipid parameters in this population on the sample size of obese and morbidly obese individuals within these studies (Shamai *et al,* 2011; Nicholls *et al,* 2006). The correlation between BMI and TG and HDL-C in obese patients, other than LDL-C, has been established by recent observational studies. These results raised the issue of potential "obesity paradoxes," where LDL-C rates with high BMI levels would increase or decrease (McTigue *et al,* 2006; Drapeau *et al,* 2006).

AIMS OF THE STUDY

- The present research aimed at studying the levels of heavy smoker's male's lipid profiles and body mass index compared to non-smokers males ' in some populations of Baghdad City at the Al-Razi Medical Center on the capital's Karkh side.
- If there is a correlation frequency or not between ABO blood groups and other parameters in smokers and non- smokers.

MATERIALS AND METHODS

The study was carried out on a randomly selected sample of adults, Iraqi male smoker and non-smoker that attended the Al-Razi Medical Center in the Karkh side of the capital, Baghdad From the first June 2018 to second January 2019. The total number of samples included was 343 subject; all were based on use (systematic random probability) in the age range of 30-60 years of one hundred and eighty-three adult male smokers and one hundred and sixty non-smokers selections. The data collection provided by Questionnaire was constructed for the study which composed of Socio-demographic data that included Age, geographic area of a person (Baghdad capital city or province), smokers (more than 20 cigarettes, heavy) or non-smokers. BMI (length in cm and weight in Kg), education level (low, elementary certificate or highly educated, university degree).

Sample Collection then Preparation

Venous blood was taken from an adult to investigate the blood group and Rh type, one milliliter of blood was tested closely following the collected directly. Anti-A, anti-B and anti-D monoclonal blood group reagents were always used to define the ABO and Rh (D) phenotype by slide method agglutination at room temperature. Complete blood count (CBC) test was done for all samples of blood collected in EDTA tube, CBC analyzer (Hematolyzer 5 Pro) was used to count Hb and PCV. Other blood samples were mainly collected in Gel tubes and centrifuged at 3000 rpm for 5 minutes to get serum for measuring (TG, Serum cholesterol, LDL, HDL, and VLDL) by using the automated system (Mindary-Chem).

Statistical Analysis

The statistical analysis was performed using the statistical package for social sciences (SPSS), version 23 and (Excel 2010). Qualitative data were presented using number and percentage. Quantitative data were presented using mean and standard deviation. 5% level was chosen as Significance for results.

The statistical tests were used:

A. Chi-square test: in categorical variables

B. T-test: in normal quantitative variables.

C. ANOVA test: in normal quantitative variables.

Statistical significance was achieved at $p < 0.05$.

RESULTS

Categorical variable frequency distribution (n 343). Table (1), showing age groups per year, body mass index Kg/ M^2, level of education, ABO blood group and RH. Statistically high-significant, P=0.00 with body mass index Kg/ M^2 was the predominant frequency proportion (125, 68.3 %), obese in smoker groups, while the predominant frequency

proportion (116, 72.5 %) was normal weight in non-smoker groups. Statistically significant (P < 0.05) with age groups/ years and education levels, the predominant frequency percentage of the age groups in smokers and non-smokers groups was (30-40 years) with (93, 50.8%) and (88, 55%), P = 0.026 respectively. Low educational levels in smokers and non-smoker groups were predominantly frequency ratio (128, 69.9 %), (92, 57.5 %), P = 0.017. The most common percentage of ABO groups was O-groups (74, 40.4%), (60, 37.5%) in smokers and non-smokers, respectively, P = 0.579. Non-significant statistical findings (P > 0.05) were for ABO and RH groups. While the most prevalent proportion of RH in smokers and non-smokers was positive (170, 92.9 %), (152, 95 %), P = 0.417, respectively. Non-significant results (P > 0.05).

Table 1: Frequency distribution of categorical variables (n 343) in smoker and non-smoker groups.

Parameters			Smoker		Pearson Chi-Square (P-value)
			Have (N=183)	Non (N=160)	
Age groups / Year	30 - 40	N	93	88	P=0.026 Sign. (P<0.05)
		%	50.8%	55%	
	41 - 50	N	82	72	
		%	44.8%	45%	
	51 - 60	N	8	0	
		%	4.4%	0%	
Body mass index Kg/M²	Normal weight	N	5	116	P=0.00 Highly Sign. (P<0.01)
		%	2.7%	72.5%	
	Over weight	N	53	32	
		%	29%	20%	
	Obese	N	125	12	
		%	68.3%	7.5%	
Education Level	Low	N	128	92	P=0.017 Sign. (P<0.05)
		%	69.9%	57.5%	
	High	N	55	68	
		%	30.1%	42.5%	
ABO blood grouping	A	N	44	32	P=0.579 Non sign. (P>0.05)
		%	24%	20%	
	B	N	51	52	
		%	27.9%	32.5%	
	AB	N	14	16	
		%	7.7%	10%	
	O	N	74	60	
		%	40.4%	37.5%	
RH	Negative	N	13	8	P=0.417 Non sign. (P>0.05)
		%	7.1%	5%	
	Positive	N	170	152	
		%	92.9%	95%	

Continuous variables descriptive (Mean ± Standard deviation) and inferential statistics (P-value). Table (2), all of the parameters were highly significant (P = 0.00, P <0.01), with the exception of age/ year were non-significant (P > 0.05) with (40.88±6.978), (40.73±6.364) in smokers and non-smokers, P = 0.831. The Mean ± Standard deviation of body mass index Kg/ M2 was (31.626±3.5773), (24.050±3.1214) in both smokers and non-smokers groups. The Mean ± Standard deviation of PCV% in smokers and non-smokers was (60.23±3.612), (45.58±2.330) respectively. The Hemoglobin mg/dl Mean ± Standard deviation was (18.070±1.08370), (13.673±0.6990) respectively in smokers and non-smokers groups. The Mean ± Standard deviation of Serum Triglyceride mg /dl was (280.52±102.742), (90.95±21.614) in groups of smokers and non-smokers respectively. In groups of smokers and non-smokers respectively, the Mean ± Standard deviation of Total Cholesterol mg/dl was (351.37±79.560), (171.58±9.530). The Mean ± Standard deviation of serum HDL mg/dl was respectively in smoker and non-smoker groups (31.07±3.169), (44.88±5.742). Smoker and non-smoker groups (264.224±82.4503), (108.495±10.7505), respectively, had the Mean ± Standard deviation of serum LDL mg/dl. Finally, Smoker and non-smoker groups (56.104±20.5484), (18.205±4.3036), respectively, had the Mean± standard deviation of serum VLDL mg/dl.

Table 2: Descriptive and inferential statistics of the continuous variables in smoker and non-smoker groups (n 343).

Parameters	Smoker	N=343	Mean	Std. Deviation	T - test (P-value)
Age / Year	Have	183	40.88	6.978	P=0.831 Non sign. (P>0.05)
	Non	160	40.73	6.364	
Body mass index Kg/M²	Have	183	31.626	3.5773	P=0.00 Highly Sign. (P<0.01)
	Non	160	24.050	3.1214	
PCV %	Have	183	60.23	3.612	P=0.00 Highly Sign. (P<0.01)
	Non	160	45.58	2.330	
Hemoglobin mg/dl	Have	183	18.070	1.0837	P=0.00 Highly Sign. (P<0.01)
	Non	160	13.673	0.6990	
Serum Triglyceride mg/dL	Have	183	280.52	102.742	P=0.00 Highly Sign. (P<0.01)
	Non	160	90.95	21.614	
Total Cholesterol mg/dL	Have	183	351.37	79.560	P=0.00 Highly Sign. (P<0.01)
	Non	160	171.58	9.530	
Serum HDL mg/dL	Have	183	31.07	3.169	P=0.00 Highly Sign. (P<0.01)
	Non	160	44.88	5.742	
Serum LDL mg/dL	Have	183	264.224	82.4503	P=0.00 Highly Sign. (P<0.01)
	Non	160	108.495	10.7505	
Serum VLDL mg/dL	Have	183	56.104	20.5484	P=0.00 Highly Sign. (P<0.01)

Figure (1), Show the mean-variance of constant factors for both smokers and non-smokers, including age, BMI kg/ M2, PCV%, haemoglobin, triglycerides, cholesterol, HDL, LDL and VLDL were found to be very parallel in age groups, while other findings showed a marked distinction.

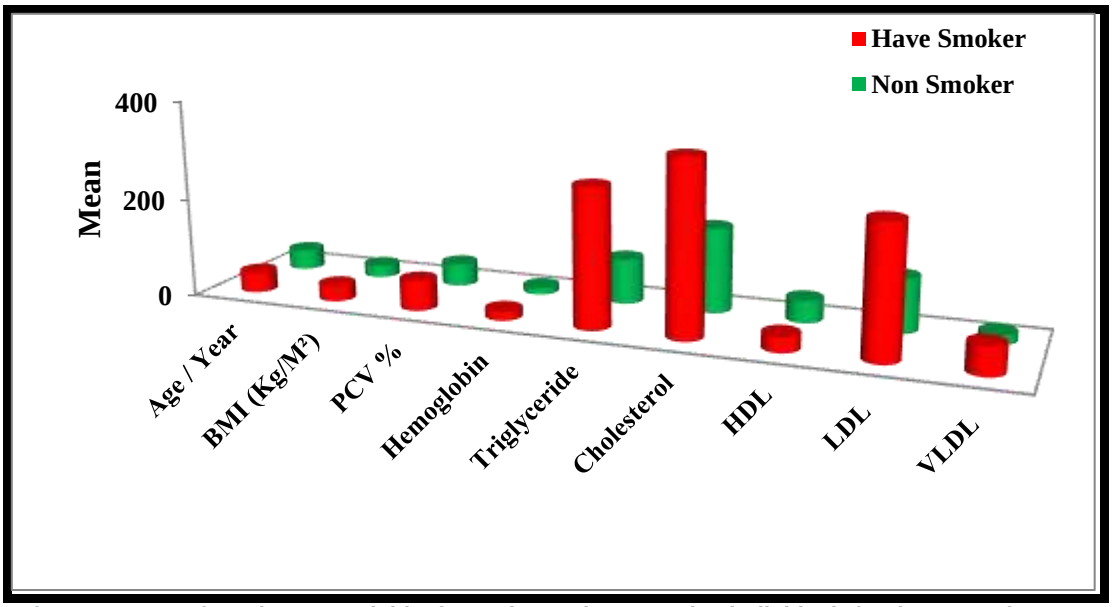

Figure 1: Mean of continuous variables in smoker and non-smoker individuals for the research group parameters.

Table (3) and Figure (2) demonstrate the association between the frequency and Mean ± Standard deviation of the variables (parameters) within the types of category groups, BMI Kg/ M2 (normal weight, overweight, obese) listed in the table and the figure below, as follows for the parameters in this research group. All findings except for serum HDL mg/dL and age/year are high in frequency and high-level with mean ± SD within obesity group, frequency

number = 137, followed by normal weight, frequency number = 121 with low-level of mean ± SD and, lastly, low frequency overweight, frequency number = 85, statistically significant differences among three categories of all categorical variables of BMI in this study (P < 0.01), Positive interaction between the two groups. Statistically, the LSD was also a very significant difference (P1, P2 and P3 < 0.01), except for P2, which refer to age/year (p2 > 0.05). Mean ± standard deviation for those age / year variable within BMI category groups: high frequency obesity groups (40.19 ± 6.675), normal weight groups (40.10 ± 6.242) and overweight groups (42.810 ± 6.999), P = 0.006, P1 = 0.004, P2 = 0.913 and P3 = 0.004, high significant differences related to obesity with mean age 40.19. Mean ± standard deviation for Packed Cell Volume (PCV %) variable within BMI category groups: high-frequency obesity groups (59.36 ± 5.356), normal weight groups (45.87 ± 4.121) and overweight groups (54.51 ± 6.738), P = 0.00, P1 = 0.00, P2 = 0.00 and P3 = 0.00, high significant differences related to obesity with mean PCV% 59.63. Mean ± standard deviation for those of hemoglobin mg/ dl variable within BMI category groups: high frequency obesity (17.81 ± 1.607), normal weight (13.76 ± 1.236) and overweight (16.35 ± 2.021), P = 0.00, P1 = 0.00, P2 = 0.00 and P3 = 0.00, high significant differences related to obesity with mean hemoglobin concentration mg/ dl 17.81. Mean ± standard deviation for serum triglyceride mg / dl variable within BMI category groups: high frequency obesity (271.50 ± 118.815), normal weight (87.14 ± 28.23) and overweight (213.49 ± 98.317), P = 0.00, P1 = 0.00, P2 = 0.00, P3 = 0.00, high significant differences related to obesity with mean serum triglyceride level mg / dl 271.50. Mean ± standard deviation for individuals with total serum cholesterol concentration mg / dl distributed within BMI category groups: high frequency obesity (345.77 ± 87.051), normal weight (178.58 ± 46.905), overweight (267.93 ± 99.718), P = 0.00, P1 = 0.00, P2 = 0.00, P3 = 0.00, high significant differences related to obesity with mean total serum cholesterol level mg / dl 345.77. Mean ± standard deviation for HDL concentration mg / dl, serum individual variable within BMI category groups: high frequency obesity (31.34 ± 2.976), normal weight (45.96 ± 6.385), overweight (35.41 ± 6.005), P = 0.00, P1 = 0.00, P2 = 0.00, P3 = 0.00, high significant differences related to normal weight with mean serum HDL level mg / dl 45.96. Mean ± standard deviation for LDL concentration mg / dl, serum individual variable within BMI category groups: high frequency obesity (260.16 ± 86.511), normal weight (115.17 ± 46.117), overweight (189.82 ± 91.403), P = 0.00, P1 = 0.00, P2 = 0.00, P3 = 0.00, high significant differences related to obesity with mean LDL concentration mg / dl 260.16. Mean ± standard deviation for VLDL level mg / dl, serum individual variable within BMI category groups: high frequency obesity (54.30 ± 23.763), normal weight (17.45 ± 5.629), overweight (42.69 ± 19.664), P = 0.00, P1 = 0.00, P2 = 0.00, P3 = 0.00, high significant differences related to obesity with mean VLDL concentration mg / dl 54.30.

Table 3: Category groups of body mass index Kg/ M2 distribution within the continuous variables (n 343).

Parameters	BMI groups Kg/M²	N=343	Mean	Std. Deviation	ANOVA test (P-value)	LSD test (P-value)
Age / Year	Normal weight	121	40.10	6.242	P=0.006 Highly Sign. (P<0.01)	P^1=0.004 HS
	Over weight	85	42.81	6.999		P^2=0.913 NS
	Obese	137	40.19	6.675		P^3=0.004 HS
PCV %	Normal weight	121	45.87	4.121	P=0.00 Highly Sign. (P<0.01)	P^1=0.00 HS
	Over weight	85	54.51	6.738		P^2=0.00 HS
	Obese	137	59.36	5.356		P^3=0.00 HS
Hemoglobin mg/dl	Normal weight	121	13.76	1.236	P=0.00 Highly Sign. (P<0.01)	P^1=0.00 HS
	Over weight	85	16.35	2.021		P^2=0.00 HS
	Obese	137	17.81	1.607		P^3=0.00 HS
Serum Triglyceride mg/dL	Normal weight	121	87.14	28.23	P=0.00 Highly Sign. (P<0.01)	P^1=0.00 HS
	Over weight	85	213.49	98.317		P^2=0.00 HS
	Obese	137	271.50	118.815		P^3=0.00 HS
Total Cholesterol mg/dL	Normal weight	121	178.58	46.905	P=0.00 Highly Sign. (P<0.01)	P^1=0.00 HS
	Over weight	85	267.93	99.718		P^2=0.00 HS
	Obese	137	345.77	87.051		P^3=0.00 HS
Serum HDL mg/dL	Normal weight	121	45.96	6.385	P=0.00 Highly Sign. (P<0.01)	P^1=0.00 HS
	Over weight	85	35.41	6.005		P^2=0.00 HS
	Obese	137	31.34	2.976		P^3=0.00 HS
Serum LDL mg/dL	Normal weight	121	115.17	46.117	P=0.00 Highly Sign. (P<0.01)	P^1=0.00 HS
	Over weight	85	189.82	91.403		P^2=0.00 HS
	Obese	137	260.16	86.511		P^3=0.00 HS
Serum	Normal weight	121	17.45	5.629	P=0.00	P^1=0.00 HS

VLDL mg/dL	Over weight	85	42.69	19.664	Highly Sign. (P<0.01)	P^2=0.00 HS
	Obese	137	54.30	23.763		P^3=0.00 HS

LSD = lest significant difference, P^1= Normal weight Vs Over weight, P^2= Normal weight Vs Obese, P^3= Over weight Vs Obese, HS= Highly Sign. (P < 0.01) & NS= Non sign. (P > 0.05).

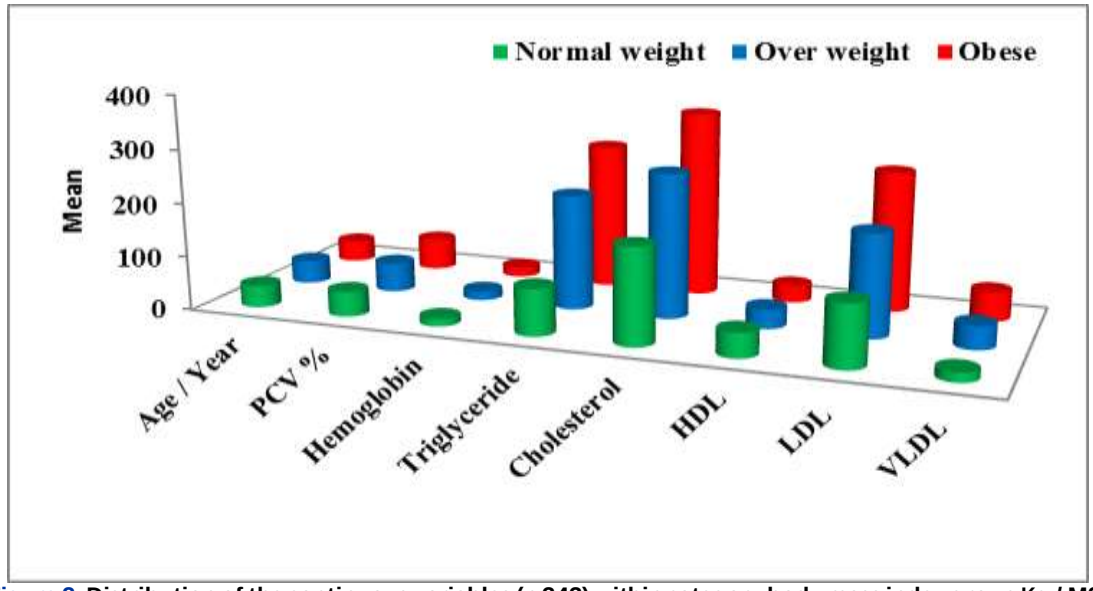

Figure 2: Distribution of the continuous variables (n 343) within category body mass index group Kg / M2.

DISCUSSION

From the present study, which included a comparison between the group males of smokers reported with heavy smokers (more than twenty cigarettes per day) and non-smokers male, the results in Table 1 showed statistically significant differences between the two groups in the age group to a high frequency percentage of young male people aged between 30 and 40 years, for BMI, these statistically significant differences in frequency percentage tend to have a high proportion of the non-smokers ' group's normal weight compared to the high proportion of obesity in the heavy smokers ' group, regarding the level frequency percentage of education of both groups, there was a high percentage of the low level of education of both groups, smokers and non-smokers with a statistically significant difference, eventually, blood types frequency percentage in which the highest percentage appeared to be blood type (O+) and for both groups with no significant statistical differences between (smokers and non-smokers respectively). These results are consistent with previous studies except for ABO blood grouping where there are no statistically significant differences (P> 0.05) in blood type percentage frequency (O+) for both male smokers and non-smoker control male group. The conclusions of the current study by a sample of blood donors contradict the results of Cohen and Thomas (1962), given that the relationship between smoking habits or pipe or cigarette quantities consumed and the specific ABO / Rh blood group cannot be shown to be significant; In contrast, sample distribution of the ABO blood group does not differ significantly from their distribution in the Republic of Ireland (Geoffery *et al,* 1964). Table 2 and Figure 1 show differences in the mean of continuous variables for groups of heavy smokers and non-smokers of males based on (P-Value) through (T-Test), In this study, there were statistically significant differences (P < 0.0 1) in the mean variables for both the group of heavy smokers and the control group of non-smokers males which include (body mass index Kg/ M2, PCV%, hemoglobin mg/ dl, S. triglyceride mg/ dl, S. total cholesterol mg/ dl, , S. LDL mg/ dl, S. VLDL mg/ dl) as these differences tend to high mean values of these variables in heavy smokers compared to the control group of non-smoking males, except in the case of the variable which includes (S. HDL mg/ dl) where the significant statistical difference in the mean of this variable for both groups tends to the highest mean value of S. HDL in the control group of non-smoking males compared to the heavy smoker males a high statistical significance (P < 0.01), while there were no statistically significant differences in the mean age of both groups. These results confirm with earlier studies showing that smoking is associated with an increase in total cholesterol, triglycerides, LDL-C, VLDL and a decrease in HDL-C levels (Joshi *et al,* 2013; Ratnam *et al,* 2014). Table 3 and Figure 2 show the distribution of all continuous variables in this questionnaire to three types of BMI categories (normal weight, overweight and obese), all of these results have differences in the mean of these variables (age / year, PCV%, haemoglobin mg / dl, S. triglyceride mg / dl, S. total cholesterol mg / dl, S. HDL mg / dl, S. LDL mg / dl, S. VLDL mg / dl) between these three types of body mass index (normal weight, overweight and obese) and are highly statistically significant (P < 0.01), the high interaction between two or three of these continuous variables within these three category variables (BMI index Kg / M2) is due to these high statistical differences. From the findings of the current study in Table 3 and Figure 2, variations are observed in the mean of

continuous variables (PCV%, hemoglobin mg / dl, S. triglyceride mg / dl, S. total cholesterol mg / dl, S. LDL mg / dl, S. VLDL mg / dl) in the classification of body mass indexes (normal weight, overweight and obesity), with high statistical significance (P < 0.01), due to the higher mean of continuous variables of overweight categories and obesity respectively, with the exception of the continuous variables (age / year), the differences are highly statistically significant (P < 0.01) due to the high mean age in the obese and normal weight categories, while the statistically significant differences in the continuous variables (S. HDL mg/dl) are due (P < 0.01) to the high mean S. HDL mg/dl, respectively, in normal-weight and overweight. These findings are consistent with a previous study indicating a high percentage of irregular TG. For females, LDL-C rates are found to be significantly higher. There was also a significant negative correlation between the levels of HDL-C and BMI, meanwhile, it was found that the relationship between LDL-C and BMI was insignificant and HDL-C was shown to be significantly higher in normal BMI patients. Such findings are important as they affirm the moderate effect of BMI on the lipid profile [Arshad *et al,* 2019).

CONCLUSION

From this short study, concluded that heavy smoking of more than 20 cigarettes per day and for a long time in the youth population has serious health consequences for the smoker in terms of its adverse and high effect on the total body fat levels, triggering a condition called dyslipidemia which causes atherosclerosis and cardiovascular disease. The adverse effect was due to the increasing level of both total cholesterol, triglycerides and LDL cholesterol with a significant reduction in the level of HDL cholesterol. Concerning BMI and its relation to body fat, this study found that the levels of total cholesterol, triglycerides, and LDL cholesterol are significantly increased relatively while the levels of HDL cholesterol are decreasing in both obese and overweight. Finally, with relation to the ABO blood grouping of both smokers and non-smokers in this short study, it was observed that for both groups with no significant statistical differences the blood group belonging to the blood group (O+) is the highest frequency percentage followed by the group (B+) and (A+) respectively.

CONFLICT OF INTEREST

None

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