STUDY OF LIPID PROFILES AND BODY MASS INDEX OF HUMANS OF CENTRAL ZONE OF MADHYA PRADESH

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ABSTRACT: The body mass index (BMI) is a measure of relative size based on the mass and height of an individual. Aim: As Overweight and obese individuals are at an increased risk for many diseases and health conditions and also as a measure of underweight, owing to advocacy on behalf of those suffering with eating disorders, such as anorexia nervosa and bulimia nervosa our aim of study is to determine the BMI status of age between 20 and 66 years human of central zone of Madhya Pradesh. The fasting serum submitted to lipid profile analysis, including serum level of total cholesterol (TC) , High(HDL-c) , triglycerides (TG)were measured by using enzymatic method and Non HDLD and a fraction of cholesterol of low (LDL-c) which calculated mathematically besides of life habits and anthropogenic data . The mean BMI (Kg/cm2) in male (21.39 ± 2.18) is higher than the mean BMI in female (21.97 ± 1.88), P value (0.482). The mean total concentration of cholesterol, LDL-c and VLDL (mg/dl) in males $(175.39\pm43.78, 105.58\pm46.27, 27.08\pm10.54)$ respectively is less than in females $(179.32\pm25.19, 109.29\pm25.88, 22.97\pm7.23)$ correspondingly. The mean total concentration of HDL-c and TG $(53.16\pm28.80, 136.04\pm50.39)$ respectively are higher in male than those in female $(45.29\pm08.57, 114.23\pm34.68)$ correspondingly. The obesity of young males (25.00%) is more prevalence than the obesity of young females (2.15%). The risk concentration of total cholesterol, LDL-c and Non HD Land the lipid indices (Total cholesterol/HDL,LDL/HDL and VLDL) are higher in females than males and this indicate that the young females have more risk to develop cardiac problems in older ages.

KEYWORDS: BMI, Triglycerides; Cholesterol, HDL, LDL, Central India Madhya Pradesh.

INTRODUCTION:-
Lipids, represented by phospholipids, cholesterol, triglycerides (TG) and fatty acids, are considered essential to the human body, both by making up of the basic structure of cell membranes (phospholipids), and by acting as a precursor to steroid hormones, bile acids and vitamin D, as well as being a constituent of cell membranes, acting on the fluidity of the latter and in the activation of the enzymes located there (cholesterol).

As for TG, these are formed from three fatty acids bound to a glycerol molecule and constitute one of the most important forms of energy storage in the body, and are deposited in the adipose and muscle tissue. In relation to lipoproteins, it is emphasized that these allow the solubilization and transport of lipids, usually hydrophobic substances, in aqueous plasma. It is important to note that there are four major classes of lipoproteins separated into two groups: a) those that are TG-rich, larger and less dense, represented by chylomicrons, of intestinal origin, and very low density lipoproteins, of hepatic origin, and b) those rich in cholesterol, forming low density (LDL-c) and high density (HDL-c) particles.

In many situations, the concentrations of these lipids and/or lipoproteins are not in normal amounts in the human body, in what is known in the scientific literature as dyslipidemia. Studying the lipid profile (total cholesterol biochemical determinations - TC, HDL-c, TG and LDL-c) after fasting for 12 to 14 hours, has been an activity of great value, considering that the research already carried out, and correlation between the morphology of the arteries obtained from autopsies and cardiovascular risk factors, has allowed it to be demonstrated that dyslipidemia is a factor of great importance for the development of atherosclerosis in later life, as well as for the development of other health disorders such as metabolic syndrome and type 2 diabetes mellitus.

Body fat is an essential part of the body. It provides an important energy source, acts as a heat insulator and shock absorber, is the source of estradiol in women and produces numerous hormones such as adiponectin, resist in and lepton. Determining your percent body fat is very important because the amount of fat in your body is related to health as well as fitness and sports performance. Too much or too little fat in the body poses problems. Body fat can be divided into two categories: Essential fat and storage fat. As its name implies, essential fat is necessary for normal, healthy functioning. It is stored in small amounts in your bone marrow, organs, central nervous system and muscles. In men,

essential fat is approximately 3% of body weight. Women, however, have a higher percentage of essential fat — about 12%. This is because their essential fat also includes some sex-specific fat found in the breasts, pelvis, hips and thighs. This sex-specific fat is believed to be critical for normal reproductive function.

Dyslipidemia or hyperlipidemia attributed to bad life style and absence of physical activities is now considered as one important factor in developing the cardiovascular diseases (De. Freitas et. al ; 2013).

This age category (20-30 years old) is important to predict cardiovascular risk factors in the next 20-30 years of life (Zemdegs et. al. 2011), Bad habits like fast food intake, lack of exercise that enable burn out the excess lipid in blood , with other Familial factors may lead to a gradual deposit of bad lipid (LDL-C, total serum cholesterol and non HDL-C group (Aziz et.al. 2003) Many studies indicate that there is a strong relationship between overweight people (obesity) and high levels of cholesterol, TC , LDL-c, and a decreased level of HDL-c (Njelekela et.al. 2002). Measuring the lipid profile (total cholesterol – TC, HDL-c, TG , LDL-c and Non HDL) and the body mass index are considered to correlate their importance in deciding the risk factors of atherosclerosis (R. M. Oliver; 1967).

MATERIAL AND METHODS:-
Studying group
This is a cross-sectional study conducted with human, of both genders in the period January-December 2016. This study was performed on central India Madhya Pradesh 20-66 years old, regardless of sex. Information about Smoking, Alcohol intake, diabetes mellitus, cardiovascular problems and family history of hypertension, diabetes mellitus ,cardiovascular diseases was correlated by self-administered questionnaires.
Measurements:
Blood samples withdrawn after an overnight fasting (12h) in young people, Samples were then subjected for centrifugation to obtain serum of at least 2 ml and stored immediately in deep freeze of -170C for later assessment of lipid profile including total cholesterol (TC), Triglyceride (TG-CH), High density lipoprotein (HDL-c), Low density lipoprotein (LDL-c) and Non HDL – cholesterol were calculated by standard method. Height measured to the least centimeter, body weight measured and BMI calculated as the weight (kg) divided by the height squared (m2), obesity defines as BMI $\geq$30 Kg/meter square, Data subjected to statical analysis using ANOVA at the significance level of P $\leq$0.05.

RESULTS AND DISCUSSION:
The metabolism of lipid of an overnight fasting young adult compared with two important indices body mass index (BMI) and Non-HDL index is summarized in table.1.

The mean BMI (Kg/cm2) in males (21.39$\pm$2.18) is higher than mean BMI in females(21.97$\pm$1.88), P value (0.482). 33.09% of males and 81.75% of females have normal weight (BMI 18.5-24.99), 40.90% of males and 15.9% of females are overweight (BMI 25-29.99) and 25% of males and 2.15 of females are obese (BMI $\geq$30)

The mean Total concentration of cholesterol (mg/dl) in males (175.39 $\pm$ 43.78) is less than the mean total cholesterol in females (179.32$\pm$25.19), P value (0.005). Male and female values of cholesterol $\leq$ 200 are (73.41%, 55.54%) respectively and the male and female values of cholesterol 200-239 are (26.59%, 44.46%) individually.

The mean total concentration of LDL-c (mg/dl) in males (105.58$\pm$46.27) is less than the mean total concentration of LDL-c in females (109.29 $\pm$25.88), p value (0.013). 65.80% of males and 31.84% of females have LDL-c ($\leq$100 mg/dl) , 20.26% of males and 26.00% of females have LDL-c (100-129 mg/dl) and 13.94% of males and 43.15% of females have LDL-c (130-159 mg/dl).

The mean total concentration of HDL-c (mg/dl) in males (53.16$\pm$28.80) is higher than the mean total concentration of HDL-c in females (45.29$\pm$08.58), P value (0.110). 4.64% of males and 10.09% of females have HDL-c ($\leq$40 mg/dl) while 95.36% of males and 89.01 % of females have HDL-c ($\geq$40 mg/dl).

The mean total concentration of triglycerides (mg/dl) in males (136.04$\pm$50.39) is higher than the mean total concentration of triglycerides in females (114.23$\pm$34.64), P value (0.034). 87.36% of males and 94.46% of females have triglycerides ($\leq$150 mg/dl) and 12.63% of males and 5.54% of females have triglycerides (150-199 mg/dl).

The mean total concentration of VLDL (mg/dl) in males (27.08$\pm$10.54) is lower than the mean total concentration of VLDL in females (22.97$\pm$07.23), P value (0.043).

The social and demographic data and data on lifestyle habits were collected by means of a self-administered questionnaire, which used a theoretical framework appropriate to each of the subjects:

Sedentary lifestyle - the following were classified as sedentary: students who said they did not practice regular physical activity at least three times per week and for at least thirty consecutive minutes per exercise activity (Souza L.J. et.al. ;2003).

Smoking - was classified into four categories: daily smokers (those who smoked at least one cigarette per day for at least a month before completing the questionnaire), occasional smokers (those who do not smoke daily), former smokers (those that after having

been smokers, had stopped smoking at least one month before), and nonsmokers (those who had never smoked or had been smoking for less than a month) (WHO; 2000).

Regarding the demographic data, it should be made clear that all measurements were performed by a group of duly-trained nurses who followed the following standards rigorously:

Weight - was measured with the student's barefoot, wearing light clothing and without wearing accessories. For this purpose, we used an electronic anthropometric scale for adults, with 200 kg capacity;

Height - inelastic anthropometric tape fixed to a smooth wall was used and respondents were instructed to position themselves erect and motionless, hands flat on their thighs and their heads placed in the Frankfurt plane;

Body mass index (BMI) - defined as the ratio of the weight (kg) by the square of the height (m$^{2)}$ was

calculated and analyzed, taking into account the criteria of the World Health Organization (2000), i.e., considered as low if BMI <18.5 kg/m^2; normal if ≥18.5 and <25.0, overweight if values between 25.0 and 29.9 kg/m^2, and obese if BMI ≥30 kg/m^2;

For the statistical analysis, SPSS software, version 16.0 was used. For the continuous-type sociodemographic and economic variables, we calculated the average and standard deviation. To associate the lipid profile with gender, we used the median of the variables and the Mann-Whitney test. In the association between the mean serum levels of total cholesterol, HDL-c, LDL-c and triglycerides with variables related to lifestyle and demographics, we used the ANOVA variance and then T- test. For all crosses those whose *P value* was less than 0.05 were considered significant.

Table (1): Metabolism of lipids of an overnight fasting young adult's males and females with two important indices body mass index (BMI) and Non- HDL index SD (standard deviation)

Anthropometric and metabolic parameters according to gender

	Male		Female		
	Mean±SD	**%**	**Mean±SD**	**%**	**P Value**
BMI (Kg/Cm^2)	21.39±02.18		21.97±01.88		0.482
18.5-24.99		33.09		81.75	
25-29.99		41.90		16.50	
≥30		25.00		2.15	
Total Cholesterol (Mg/dl)	175.39±43.78		179.32±25.19		0.005
≤200		73.41		55.54	
200-239		26.59		44.46	
LDL-c(Mg/dl)	105.58±46.27		109.29±25.88		0.013
≤100		65.80		30.84	
100-129		20.26		26.00	
130-159		13.94		43.15	
HDL-c(mg/dl)	53.16±28.80		45.29±08.57		0.110
≤40		4.64		10.09	
≥40		95.36		89.01	
Triglycerides(TG)(mg/dl)	136.04±50.39		114.23±34.68		0.034
≤150		87.36		94.46	
150-199		12.63		5.54	
VLDL (Mg/dl)	27.08±10.54		22.97±07.23		0.043
≤130		34.05		80.80	
≤160		41.90		14.90	
≤190		24.85		04.28	

CONCLUSION:

The results of the study indicate that changes to the lipid profile were present in the population studied. High levels of triglycerides, total cholesterol and LDL-c were found in Central India Madhya Pradesh. The obesity of

young males is more prevalent than the obesity of young females. The mean total concentration of cholesterol, LDL-c and Non- HDL are less in male than female while the mean total concentration of HDL-c and TG are higher in male than in female. The lipid indices (Total

cholesterol /HDL, LDL/HDL Non- HDL/HDL) are less in male than female. These results indicate that the young females may be subjected to developing cardiac problems in older age. According to above data of this study and other investigator findings we recommend an evaluation of the link between lipid values and expecting risk factors upon the cardiovascular system.

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