SERUM LIPID AND LIPOPROTEIN PROFILE IN CARDIOVASCULAR PATIENTS IN SOLAN.

*Garima Bharti 1, Indra Pathania 2
1Department of life sciences, Manav Bharti University, Solan (H.P.) 173229
2Department of Zoology, Manav Bharti University, Solan (H.P.) 173229.

ABSTRACT
Cardiovascular disease (CVD) is a critical public health issue, nationally and internationally. It is increasing in urban Indian population and lipid abnormalities are important risk factors. There are many risk factors for cardiovascular diseases that lead to enhanced risk of developing CVD. However, the main CVD risk factors are smoking, diet, obesity, hypertension, physical inactivity, dyslipidaemia, genetic influences, and diabetes. Among youth, an increase in predisposing CHD risk factors such as being overweight and following unhealthy lifestyle practices (i.e., being physically inactive, having unhealthy dietary habits) is evident (Eisenmann, 2003). Major CHD risk factors [e.g., elevations of low-density lipoprotein cholesterol (LDL-C) level; low high-density lipoprotein cholesterol (HDL-C) level] and conditional risk factors (elevations of triglycerides, small LDL-C particles) tend to cluster in youth and adults, resulting in an increased risk for coronary events such as a myocardial infarction in later adulthood (Grundy et al. 2000). BMI (Body mass index) has been consistently associated with the clustering of these CHD risk factors. Moreover, physical activity can lessen triglycerides and have an effect on both low-density lipoprotein (LDL) and high density lipoprotein (HDL) particle sizes (Szapary et al. 2003). Large-scale controlled trials have shown that lowering cholesterol in otherwise healthy adults reduces the risk of CAD (Frick et al. 1987).

Coronary heart disease (CHD) is the leading cause of morbidity and fatality in developing and developed countries (Onat et al. 1992; W.H.O. 2002; Mahley RW et al. 1995). Dyslipidemia, hypertension, and cigarette smoking are three well known major, but modifiable, risk factors of CHD (Onat et al. 1992; W.H.O. 2002; Mahley RW et al. 1995; Ozkara et al. 2008; Bersot et al. 2002). Control of major coronary heart disease risk factors has been revealed to definitively decrease the risk of CHD (Ozkara et al. 2008; Bersot et al. 2002). The prevalence of dyslipidemia can vary across population groups according to nationality, ethnicity, genetics, and socio-cultural and economic factors. Also, changes in lifestyle and diet have

INTRODUCTION:
Cardiovascular disease (CVD) is a critical public health issue, nationally and internationally. It is increasing in urban Indian population and lipid abnormalities are important risk factors. There are many risk factors for cardiovascular diseases that lead to enhanced risk of developing CVD. However, the main CVD risk factors are smoking, diet, obesity, hypertension, physical inactivity, dyslipidaemia, genetic influences, and diabetes. Among youth, an increase in predisposing CHD risk factors such as being overweight and following unhealthy lifestyle practices (i.e., being physically inactive, having unhealthy dietary habits) is evident (Eisenmann, 2003). Major CHD risk factors [e.g., elevations of low-density lipoprotein cholesterol (LDL-C) level; low high-density lipoprotein cholesterol (HDL-C) level] and conditional risk factors (elevations of triglycerides, small LDL-C particles) tend to cluster in youth and adults, resulting in an increased risk for coronary events such as a myocardial infarction in later adulthood (Grundy et al. 2000). BMI (Body mass index) has been consistently associated with the clustering of these CHD risk factors. Moreover, physical activity can lessen triglycerides and have an effect on both low-density lipoprotein (LDL) and high density lipoprotein (HDL) particle sizes (Szapary et al. 2003). Large-scale controlled trials have shown that lowering cholesterol in otherwise healthy adults reduces the risk of CAD (Frick et al. 1987).

Coronary heart disease (CHD) is the leading cause of morbidity and fatality in developing and developed countries (Onat et al. 1992; W.H.O. 2002; Mahley RW et al. 1995). Dyslipidemia, hypertension, and cigarette smoking are three well known major, but modifiable, risk factors of CHD (Onat et al. 1992; W.H.O. 2002; Mahley RW et al. 1995; Ozkara et al. 2008; Bersot et al. 2002). Control of major coronary heart disease risk factors has been revealed to definitively decrease the risk of CHD (Ozkara et al. 2008; Bersot et al. 2002). The prevalence of dyslipidemia can vary across population groups according to nationality, ethnicity, genetics, and socio-cultural and economic factors. Also, changes in lifestyle and diet have
proven to be influential (Erem et al. 2008). Dyslipidemia has clearly been shown to increase with age and is especially high among individuals worldwide between 40-60 years (Mahley et al. 1995; Ozkara et al. 2008; Bersot et al. 2002; Erem et al. 2008 and Foucan et al. 2000). Increase in lipid level has been recognized as independent and direct risk factors for CVD, It has been recognized as the most important modifiable risk factor whose early diagnosis and therapy can reduce the incidence of CVD events (Ryan et al. 2003). Women stand an equal risk of CVD after menopause; partly due to changes in their lipid levels (Johansson et al. 2003).

Poor lifestyle factors are thought to account for an increase in BMI, indirectly affecting the clustering of CHD risk factors. Lifestyle factors such as eating unhealthy foods and physical inactivity may contribute to the development of overweight status in adolescents (Goran, 2001; Hill & Melanson, 1999). Therefore, youth today are largely physically inactive and aerobically unfit. Together, over-consumption of high fat and high calorie foods and beverages, physical inactivity, and low aerobic fitness may contribute to the development of overweight status in youth.

Lifestyle factors appear to influence the accumulation of fat, which in turn relates to the development of major and conditional CHD risk factors.

**MATERIAL AND METHODS:**

Sixty three males and thirty seven females were included in the study with age range of 20 to >69 years. Patients were taken randomly from the outpatient department of hospital. Levels of serum triglyceride, cholesterol, high density lipoprotein, low density lipoprotein, very low density lipoprotein were estimated by Auto analyzer. In every case detailed history complete physical examination of the patient and relevant investigations were done. Briefly, we collected information regarding demographic data, educational status, self-perceived socioeconomic status, history of major illnesses such as coronary heart disease, hypertension, diabetes or high cholesterol levels, and smoking or tobacco intake. Physical activity was assessed according to self-reported activity into mild, moderate and severe using a validated WHO questionnaire. Body mass index (BMI) was calculated as weight (kg) divided by squared height (m). Waist-to-hip ratio (WHR) was calculated. Fasting glucose was determined at laboratory using glucose peroxidase method and external quality control. Quality control measures were also followed for estimation of total cholesterol, high density lipoprotein (HDL) cholesterol and triglycerides while low density lipoprotein (LDL) cholesterol was estimated. The surveys were conducted from starting of years Feb-may 2012.

**RESULTS:**

The age distribution in Cardiovascular patients shows that there were 16 patients in 20-29 age group,17 patients in 30-39 age group,21 in 40-49 age group,37 in 50-59 age group ,23 in 60-69 age group and 11 in >69 yrs shown in fig 1. A peak level in the age between (50-59) years represented by 37 patients and the least was in the age group between (>69) years represented by 11 patients.

Level of serum triglyceride was increased in both sexes and it shows a highly significant difference when compared with the normal level of serum triglyceride i.e.150mg/dl. Level of cholesterol in both sexes was also increased and it shows a significant difference when compared with the normal level of cholesterol i.e. 200 mg/dl.

Other biochemical parameters like serum high density lipoprotein, low density lipoprotein and very low lipoprotein density did not show any significant difference when compared with the normal values (fig 3).

Dietary level and life style was also surveyed among these subjects. It was observed that most of the peoples did not change their dietary pattern with age. Maximum of the patients were taking high fat diet including meat, chicken, butter, ghee, cheese etc.only few of were taking low fat diet including vegetables, salads and plenty of water. They take the diet rich in carbohydrates and fats. Their life style due to age and retirement is sedentary. They have no morning walk.58% 0f the patients were having mild and 39% were having moderate 3% were having vigorous physical activities. Especially those who lived in rural areas showed more physical activities rather than those who lived in urban areas. Females gain the weight due to menopause and do not make required changes in their diet.
Figure 1. Age distribution of cardiovascular patients

Figure 2. Sex distribution figure of both male and female cardiovascular patients
DISCUSSION:

The focus of this population-based study was to evaluate the lipid profile and the prevalence of risk factors of CVD among urban population in Solan of both men and women (aged 20-69 y). In our study we found that the cardiovascular failure was peaked in the age 50 to 59 years. Regarding the patients gender we found that male patients 83(66.4%) is higher than female patients 42(33.6%). In our study age wise comparison revealed that level of Cholesterol, Triglyceride, LDL were elevating while level of HDL were decreasing. Sex wise comparison shows that females had high level of HDL than Males. High level of TG, Ch, and LDL were found in both cardiac and diabetic patients; however Cardiac patients had much lower level of HDL as compared to normal patients. Age wise comparison revealed that level of Ch, TG, and LDL is more in Cardiac and Diabetic patients.

In our study young patients had more lipid profile than older age. In our study we see that patients with low HDL and high LDL have more incidences of other risk factors like Hypertension, Smoking and Diabetics. Out of 125 patients 57.6%, 72(51 male and 21 female) were hypertensive, 48 %( 60) were smokers and 40.8 % (51) (35 males and 16 females)

This study showed a high prevalence of multiple lifestyle and metabolic cardiovascular risk factors- physical inactivity, high fat intake, low fruits and vegetables intake, smoking, obesity, truncal obesity, hypertension, dyslipidemia and the metabolic syndrome in an middle class population of Solan. Important determinants of risk factors are age, gender, low educational status, high fat diet and low physical activity. The study also shows increasing prevalence of lipid abnormalities (high cholesterol and high triglycerides) in the urban middle class and stable prevalence of obesity, truncal obesity, hypertension, and metabolic syndrome. A high prevalence of multiple cardiovascular risk factors in middle socioeconomic status subjects has been reported from other parts of the world including Europe and North America. (WHO, 2002).This study is also comparable to previous studies performed in middle class Indian population. Ahlawat et al. 2002 reported significant increase in prevalence of hypertension in Chandigarh over a thirty year period and Mohan et al. reported increasing diabetes prevalence in Chennai (Mohan et al. 2006). Bansal et al. 2009 reported increasing cardiovascular risk factors in a self-selected sample of middle-level executives. The changing pattern of risk factors in the present study indicates rapidly advancing epidemiological transition (Yusuf et al. 2001) and stabilization of risk factors in this population. Causes of these trends are not clear but improving awareness and better educational status may be important (Marmot, 2004).
A high prevalence of some risk factors for CVD was observed in the aged 40–59 yrs. Increased age was associated with abnormality in some lipid profiles as. High BP and obesity were also accompanied with altered lipid and lipoprotein profile. These results show that all these parameters could be involved in the alteration of the lipid and lipoprotein profile observed in this population. However, no hormones status was investigated here.

Nevertheless, in developing countries, recent urbanization is expected to increase the level of cardiovascular risk factors as a result of the adoption of new dietary habits and increased sedentarity and stress in urban areas. The data obtained from the present study do point out that a high prevalence of some cardiovascular risk factors can be found in the urban population of Solan aged 40–59 yrs. Data as provided herein will help health officials adopt a national strategy to prevent the extension of cardiovascular risk factors in the population and could serve as a baseline for assessment of future trends in the risk factors studied. Both environmental and genetical factors play a role in determining lipid and lipoprotein plasma levels.

Thus, a careful evaluation of dietary habits and physical activity in such a population will provide new insights in the possible role of recent and marked changes in dietary patterns and lifestyle.

The mean comparison of Triglyceride level according to sex was male were having 159.42 mg/dL and females were having 130.68 mg/dL i.e. TG level was elevating in males as compared to females, the mean comparison of Cholesterol level according to sex was males were having 197.35 mg/dL and females were having 195.6 mg/dL i.e. Ch level was higher in males, the HDL of females were more i.e. 42.91 mg/dL and males were having 41.97 mg/dL and level of LDL were more in males i.e. 122.97 mg/dL but lower in females it is 121.05 mg/dL. Other parameters like HDL and LDL do not show significant difference when compared with normal level. In conclusion, this study shows a high prevalence of cardiovascular risk factors in the urban middle class subjects in Solan. Trends show that over an eight year period many risk factors such as smoking, hypertension and obesity have stabilised while biochemical risk factors are increasing. These trends are similar to the 35-year international data reported from more than 190 countries recently (Anand & Yusuf, 2011).

REFERENCES:


