

Dyslipidemia in Apparently Healthy Population of Dera Ismail Khan Pakistan

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Abstract

Dyslipidemia and its high prevalence in patients of hypertension and other non-communicable diseases is increasing. The aim of current study was to highlight the dyslipidemia in apparently healthy population by lipid profiling in Dera Ismail Khan, Khyber Pakhtunkhwa, Pakistan. 150 individuals apparently healthy and with no previous records of hyperlipidemia were recruited. Blood plasma samples were collected aseptically from healthy individuals for determination of lipid profile. Blood plasma samples were collected aseptically. Total cholesterol (TC) levels, High density lipoprotein cholesterol (HDL-C) levels, Triglycerides (TG) and low-density lipoprotein cholesterol (LDL-C) were determined. The 150 healthy subjects were between 20-70 years. Mean plasma levels of TC was 166.4 ± 28.45 mg/dl, HDL-C was 48.34 ± 8.79 mg/dl, 48.34 ± 8.79 mg/dl, LDL-C was 87.42 ± 29.82 mg/dl and TG were 151 ± 65.92 mg/dl. TC and HDL-C levels were desirable and better. The level of LDL-C level below 100 mg/dl. The triglyceride

level was recorded above upper limit. There is a need to investigate the problem of dyslipidemia at the community level. The high TC level in healthy population is an alarming situation and could be used to predict future complications associated with it.

Keywords: Dyslipidemia, Lipid Profile, Cholesterol, Lipoproteins.

Introduction

The unbalancing of the lipoproteins is known as dyslipidemia i.e., increase of total cholesterol (TC), or an increase in low-density lipoprotein cholesterol (LDL-C), or Triglycerides (TG) or low levels of high-density lipoprotein cholesterol (HDL-C) [1]. Dyslipidemia is reportedly associated with the coronary heart disease (CHD) and its pathogenesis [2]. Asians, particularly Indians have a high prevalence and risk of dyslipidemia. It is reported between 10-70% [3]. In 19-30 % of population of Pakistan dyslipidemia is major cause of stroke [4]. Ischemic heart disease (IHD), angina pectoris myocardial infarction (MI) are becoming prevalent due to hyperlipidemia [5]. A study reported that 39% of Pakistanis above 18 years have dyslipidemia [6]. Dyslipidemia is listed among one of the risk factors for coronary artery disease CAD in South Asians. The highest rates of CAD is reported in south Asian countries [7].

The dyslipidemia in women is higher than reported in men. The related risk factors are increased Body Mass Index (BMI), age, and fasting blood sugar. Mostly the patients are asymptomatic and unaware of their condition. The study also reported where dyslipidemia has high prevalence the awareness is very low among public [8]. HDL-C which is known as good cholesterol is the main cause of heart diseases when its level decreases in blood. Level of HDL-C lower than 25 mg/dl increases the risk of heart attack even if the cholesterol levels is normal i.e. 200 mg/dl [9]. The levels of HDL-C are alarmingly high in the subcontinent. It ranges between 35-38 mg/dl. It increases the risk of heart attack by narrowing and hardening of the blood vessels [9]. The unhealthy life style including fatty food and lack of physical activity contributes to the development of dyslipidemia. The marked difference in food and lifestyle of urban and rural areas is evidence of how life style effects lipid profile. The urban citizens are reported to have high serum lipid than the rural once [9].

In Pakistan during 2016, 58% deaths occurred due to non-communicable diseases and out of which 25% were premature deaths between ages of 32-70 years. This decline poses a great socioeconomic burden and decline in wellbeing of families. The high intake of dietary factors like salt and fat are considered as major contributor in these premature deaths [11].

Many studies have reported a higher prevalence of dyslipidemia in Pakistani population [12, 13]. A study reported that 50.7% of 1000 individual who were evaluated for the lipid profile showed abnormalities in level of TG, TC, LDL-C and HDL-C [14]. In hypertension patients of Khyber Pakhtunkhwa province of Pakistan, the prevalence of dyslipidemia was 28% [15].

Keeping in view the harmful effects of dyslipidemia and its high prevalence in patients of hypertension and other non-communicable diseases. This study is aimed to study dyslipidemia in apparently healthy population by lipid profiling in Dera Ismail Khan, a city in the province of Khyber Pakhtunkhwa of Pakistan.

2. Methodology

2.1. Study design

In this cross- sectional study, 150 individuals apparently healthy and with no previous records of hyperlipidemia were recruited from Dera Ismail Khan, City and its adjoining areas in Khyber Pakhtunkhwa, Pakistan. A written consent was obtained from all individuals to participate in this study. The age, gender and information about other abnormalities of all the participants' were recorded on a Performa. Blood plasma samples were collected aseptically from healthy individuals for determination of lipid profile.

2.1.1. Inclusion and Exclusion Criteria

The participants with regular therapy for the ailments such as diabetes mellitus, heartdiseases, hypertension, cancer and pregnancy were excluded. Patients with renal failure or on any steroid therapies and on herbal medications were also excluded.

2.7. Serum Lipid Profiling

Lipid profiling was carried out by using methodology previously used by Inayat et al, was applied with slight modification [15]. 5cc of blood was collected aseptically from all patients. To determine plasma lipid profile using RANDOX Kit (RANDOX Laboratories Ltd), a Digital Microlab Photometer (300-Merk) was used. The enzymatic end point method utilizing Kit Cat., No., CH 201 was carried out for determination of the Plasma total cholesterol (TC). The level of HDL-C in plasma was determined using CHOD-PAP method with Kit Cat, No. CH 203. Kit Cat., No. TR 212 was used to determine the plasma TG by GPO-PAP method. For calculation of plasma LDL-C the Friedewald equation was used when the concentration did not exceed 390 mg/dl, i.e. $LDL-C = TC - HDL - TG/5$ mg/dl. [16]. All the frequencies were calculated using the Microsoft excel.

3. Results

A total 150 healthy individuals were recruited in this study according to the defined inclusion and exclusion criteria. Of the total 150 participants, 92 (61.33%) were males and 58 (38.66%) were females. The mean ages of all participants were 41.5 years. The overall distribution of gender and mean age of sample population is shown in figure 1.

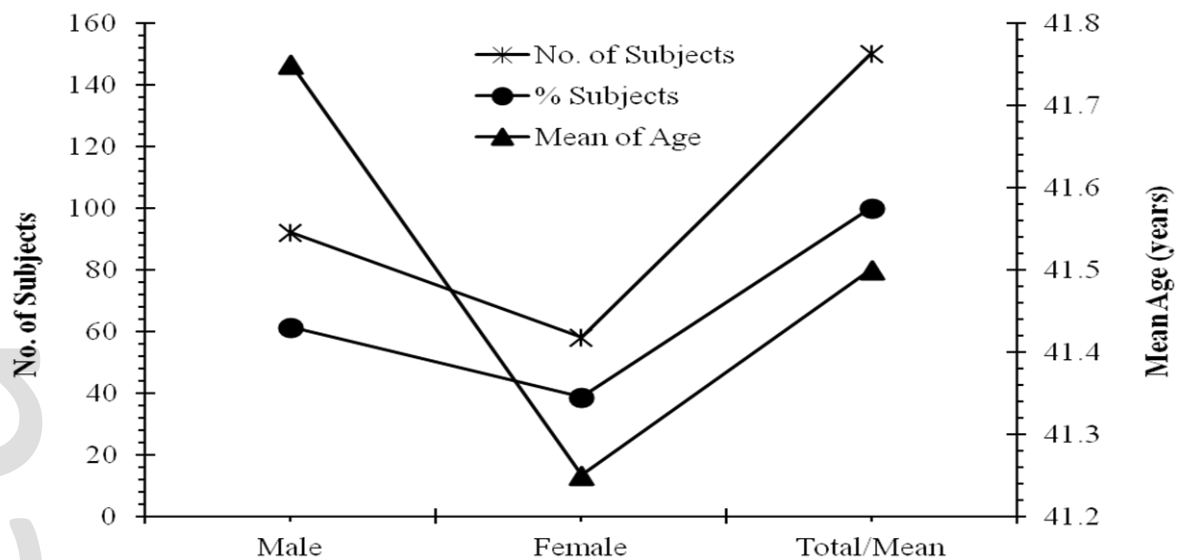


Figure 1: The overall distribution of age and gender in 150 participants of the study. The mean age was 41.5 years. (2 participants were male and 52 were female).

The age of participants was between 20 to 30 years. Of which there were 421 participants were in group of 20-30 years, 40 in the group of 31-40 years, 27 in the group of 41-50 years, 21 subjects in the group of 51- 60 years and 21 individuals were in the range of 61-70 years. Of all the participants, 58% were of the age of 20 to 50 (Table 1).

Table 1. Age wise percentage of sampled population (n = 150).

Range of age (Years)	Number of subjects	% age
20 – 30	41	27.3
31 – 40	40	26.7
41 – 50	27	18.0
51 – 60	21	14.0
61 – 70	21	14.0
Total	150	-

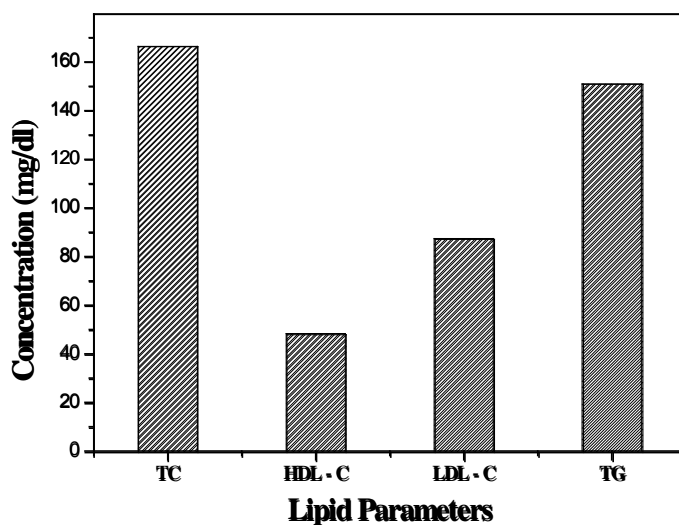


Figure 2. Concentration of TC, HDL-C, LDL-C and TG in healthy population of D.I. Khan (n = 150).

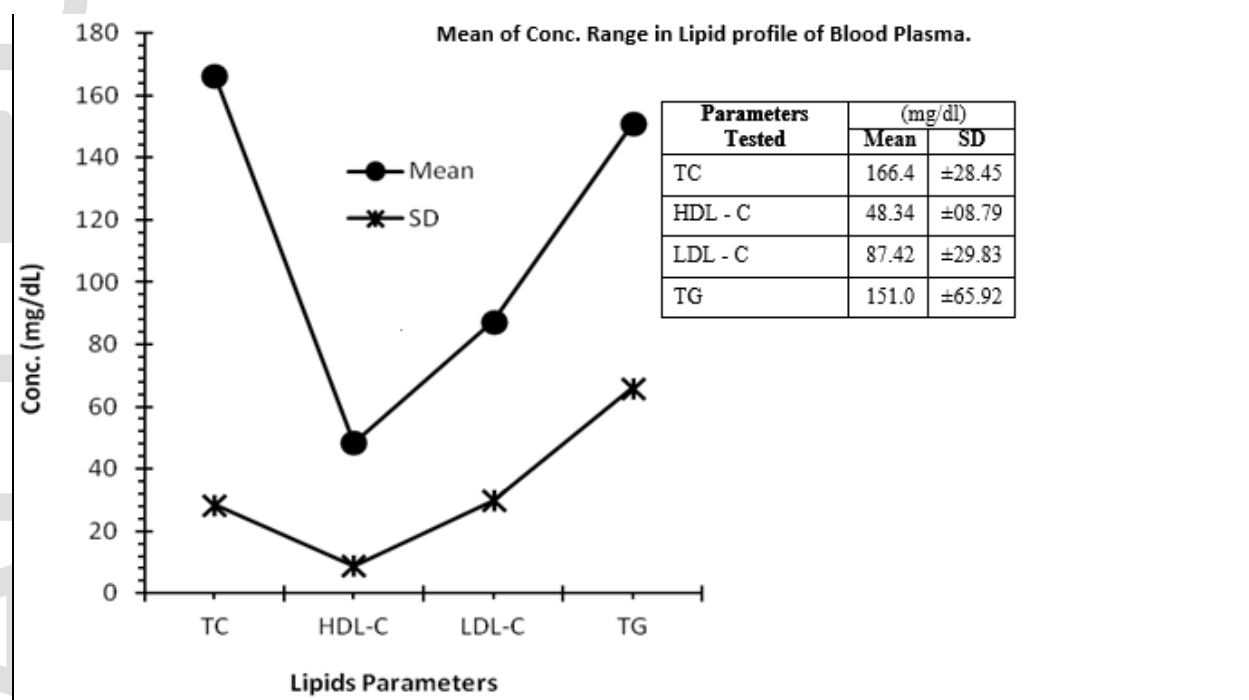


Figure 3. Lipid profile of healthy population of D.I. Khan for TC, HDL – C, LDL - C and TG (n = 150).

The mean value and standard deviation of TC was 166.4 ± 28.45 mg/dl. (Figure 2). This is a desirable value (less than 200 mg/dl). TC values for healthy people should not surpass 165-175 mg/dl in healthy. 48.34 ± 8.79 mg/dl Was the mean value for HDL-C recorded was normal range is above 40 mg/dl. So we obtained a better value of HDL-C. The LDL-C levels were 87.42 ± 29.82 mg/dl. The TG level was about 151 ± 65.92 mg/dl. It is considered as borderline high surpassing the upper limit. The concentration of TG in our study was significantly high. This is indicative of hyper triglyceridemia. It is also noteworthy that the RANDOX Kit literature and WHO specified normal recommended values for TC, HDL-C, LDL-C and TG are 100-200 mg/dL, 40-60 mg/dL, 100-130 mg/dL and 70-150 mg/dL respectively (Figure 3).

4. Discussion

The dyslipidemia has emerged as a major health concern in Pakistan [14, 15]. Dyslipidemia is reported as a major risk factor for non-communicable diseases such as hypertension [16, 17], myocardial infarction [18], cerebral vascular accidents, diabetic retinopathy [16, 19], chronic renal failure [20] and other diabetes related complications [21, 22, and 23]. These conditions have appeared as major reasons for hospitalization and early age deaths [11]. It is also associated with diabetes related complications. The dyslipidemia associated morbidity and mortality has increased in past few years. The overall effect is an increased burden on hospitals which in turn burdened the economy and well being of a population [11]. Therefore, it is crucial for the health care providers to know the pathogenesis, etiology and complications associated with dyslipidemia for better management of health related problems.

In this study the levels of TC, HDL-C and LDL-C were within the normal range. A study reported normal HDL-C for half of the participants who were dyslipidemia patients but the sample population in this study was apparently healthy individuals [24]. The levels of triglycerides (TG) were above the upper limit (or was suspected). The elevated level of triglyceride in healthy population is indicative of underlying complication and is used as risk factor [25]. The values of TC, LDL-C and TG in this study are near the value of another study from Pakistan [26, 27]. The level of LDL-C in our study is close to the study of healthy population but the findings of TC, HDL-C and TG are dissimilar [28]. A study from Port Harcourt, Nigeria reported a high mean total cholesterol and LDL cholesterol in healthy adults

[29]. This study also reported a high prevalence of obesity with a high total cholesterol. This study did not undertake the body mass index or obesity as a risk factor. In future such factors could be considered to find association with obesity as high serum cholesterol levels are reported to have a direct impact on coronary artery disease [30]. A study from Pakistan conducted on healthy adults reported a high prevalence value of low HDL-C [28, 31]. There is a need to investigate the problem of dyslipidemia at the community level. The high TC level in healthy population is an alarming situation and could be used to predict future complications associated with it.

Conclusions

This study reports a high plasma value of TG in the healthy population under study. The values of TC, LDL-C and HDL-C were within the normal range. The high triglyceridemia is indication of dyslipidemia in the local healthy population. There is a need to design strategies for developing awareness among common public about dyslipidemia, its risk factors and prevention strategies.

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