

Comparative study of Lipid Profile of Different Age Group and Gender Patients Attending OPD of Chitwan Medical College Teaching Hospital.

*Sanjay Ray Yadav¹, A.K Sinha², Birendra Yadav³, Nishu Yadav⁴ and Md. Nazrul Islam⁵

¹Research Scholar, Singhania University, Jhunjhunu, Rajasthan, India.

²Department of Biochemistry, Birat Hospital and Research Centre, Biratnagar, Nepal.

³Department of Anatomy, Nobel Medical College, Biratnagar, Nepal.

⁴Department of Microbiology, Nobel Medical College, Biratnagar, Nepal.

⁵Department of Physiology, Chitwan Medical College, Bharatpur, Nepal.

ABSTRACT:

Information regarding lipid profile of different age group in the inhabitants of Chitwan is still very scanty. Lipid Profile tests were used to assess risk of heart disease in all age group populations. Lipid Profile were assessed in 3500 patients attending OPD of Chitwan Medical College Teaching Hospital, a tertiary care teaching hospital in the eastern region of Nepal. Lipid Profile tests were performed using serum levels of total Cholesterol, Serum T.G, serum low density lipoprotein cholesterol, and serum high density lipoprotein cholesterol as indicators of risk of heart disease. Out of 3500 subjects, 90 Male patients (20-40 year age group), 90 Female patients (20-40 year age group), 90 Male patients (40-60 year age group), 90 Female patients (40-60 year age group), 90 Male patients (>60 year age group), and 90 Female patients (>60 year age group), in the study normal individuals were selectively included for lipid profile tests. The serum concentrations of all the parameters of lipid profile test in female (20-40 year age group) patients comparatively all parameters are higher than the male (20-40 year age group) except serum T.G, in female (40-60 year age group) patients comparatively all parameters are higher than the male (40-60 year age group) except serum T.G, and in female (>60 year age group) patients (Individuals) comparatively all parameters are higher than the male (>60 year age group). Therefore, from the trend of our data, we can conclude that normal range of lipid profile in female of all age groups comparatively higher than all age groups of male in the population of Chitwan. It can be suggested that lipid values obtained in this study can be used as the reference (mean) value, based on which clinical correlation can be made.

KEY WORDS: Lipid Profile, Age, Gender, and Lipid Profile test.

INTRODUCTION:

A lipid profile is a measurement of various lipids that are found in the blood. This kind of blood test is often used to assess risk of heart disease⁽²⁾.

There are two common concerns people have about lipids in their diet: One is their high caloric value, which may lead to undesired weight gain. The other is their association with high total cholesterol levels, which are a risk factor for cardiovascular disease⁽²⁾. Limiting the intake of fat and oil in the diet, especially saturated fats, may help keep cholesterol levels low and thus lower one's risk of heart disease.

One reason the USDA recommends that 10% or fewer of one's calories come from saturated fats is because the amount of saturated fat in one's diet correlates strongly with cholesterol levels. Saturated fats are generally solid at room temperature. Fat from animals (e.g. butter and lard) is almost always saturated, but some oils from plants are saturated, too (e.g. palm oil or coconut oil.)

A lipid profile contains information about several different kinds of lipid that normally circulate in the blood. Values are numerical, but in order to simplify explanation, ranges of numerical values are often placed into categories such as 'low risk,' or 'high risk.' For example, a total cholesterol level over 250 mg/dl is said to be 'high risk', but that doesn't mean a reading of 248 is fine. With total cholesterol and LDL cholesterol the higher the value, the higher the risk. Conversely, the lower the LDL cholesterol, the lower the risk. However, a low number is not a guarantee against heart disease. The population with low cholesterol is at lower risk of heart disease, but heart disease is not absent in this population.

All of these lipid levels need to be evaluated in the context of other risk factors. If you have several other risk factors, a cholesterol level of 200 mg/dl might be considered a problem, while if you have no other risk factors, it might not be. Some of the other risk factors for cardiovascular disease are: smoking, high blood pressure, diabetes, age of over 45 years for males, age of over 55 years for females, and a family history of early heart

disease. Lipids generally included in a blood lipid profile are described below. Units for these are mg/dl, or milligrams per deciliter. A deciliter is $1/10^{\text{th}}$ of a liter.

There is a great variations of plasma lipid levels in different populations and usually are affected by age, sex, food habits, life style, socio-economic status, races, heredity etc. Different Methodology adopted for the determination of lipids and lipoproteins also may have some role in variation which could not be ignored. Though in clinical chemistry, reference values are commonly based on reference of the Western population, these usually do not match with the Nepalese population specially noted in case of lipid profile. As reference values are used by clinicians for interpretation of the results of measurements, it should correctly represent a defined group of population which should have close similarity with the patients under treatment coming for investigation. A reference value may be defined as a value obtained by observation or measurement of a particular type of quantity on a reference individual⁽¹⁾. Since till date no well documented mean and standard deviation value of lipid profile of Nepalese Population are established, there is need for extensive study on lipid profile of Nepalese people. We have planned this study to evaluate the mean values and standard deviation of lipid profile of Nepalese of chitwan district and it's surrounding population according to the guidelines of the National Cholesterol Education Program (NCEP) of USA.

MATERIALS AND METHODS:

This retrospective study was carried out at the OPD of Chitwan Medical College, Bharatpur, Nepal from the period of feb 2011 to March 2013. A total of 3500 subjects were surveyed for this study. Out of 3500 subjects, 90 male patients for each age group (20-40, 40-60 and >60 yrs) were selectively included for lipid profile test. The same number of female subjects (90) for each age group (20-40, 40-60 and >60 yrs) has included in the study. All the subjects selected in the present study were inhabitants of Chitwan and its surroundings. Most of the subjects of this study were from low socioeconomic status, dietary habits, physical activity, and means of livelihood^[7,8]. All historical informations were obtained by interview and medical records. Records with incomplete information were excluded from the study. The subjects with acute illness at the time of the study were also excluded. Permission from the institution and the informed consent of the subjects were obtained for the study.

Total 3500 subjects were selected for the study in the age group of 20 yrs to >60 yrs, out of which 2150 were male and 1350 were female. 12 hrs overnight fasting clotted venous blood samples were collected irrespective

of seasonal variations throughout the year. Analysis was done within 4 hrs of collection.

METHODS:

Abnormalities in lipid profile tests are increased or decreased levels of static biochemical tests, including serum total cholesterol, serum T.G, serum low density lipoprotein, and serum high density lipoprotein. The tests are most frequently obtained as part of lipid profile test panels.

Serum levels of Total Cholesterol was estimated by Cholesterol Oxidase Method⁽³⁾ whereas estimation of Triacylglycerol (TAG) was done by Lipase/ G-ol dehydrogenase Method⁽⁴⁾. Direct: non immunological Method was used for determination of High Density Lipoprotein Cholesterol (HDL-C)⁽⁵⁾, and Low Density Lipoprotein Cholesterol (LDL-C) were estimated using the Friedewald's formula⁽⁶⁾. After eliminating the results of the lipemic samples the mean and standard deviation results were statistically evaluated. The results outside these limits were eliminated before the final mean and standard deviation were calculated.

STATISTICAL ANALYSIS:

The statistical software SPSS (version 17) was used for data analysis. The mean values of all the parameters of lipid profile tests were analyzed. Data were expressed as mean \pm SD. Unpaired student's t-test was used for group wise comparisons and p-value of <0.001 was considered statistically significant.

RESULTS AND DISCUSSION:

The results obtained for the analytes used to measure the lipid profile are tabulated in the Table 2, 3 and 4. The mean and Standard Deviation for total cholesterol, HDL cholesterol and LDL cholesterol concentrations were observed to be higher in women in comparison to men in all the age groups. Whereas in cases of TAG cholesterol, concentrations were observed to be higher in the men than women except in age group of >60 yrs. where parallel value was observed

The mean value for total cholesterol was observed to be within reference range for both the sexes in all the age groups. But the upper limit of the mean value of triacylglycerol was found to be higher in men than women except for the age groups more than 60 yrs. where the upper limit of triacylglycerol was parallel value in women and men.

In our study we have observed that the mean value of total cholesterol and HDL-C were gradually increased as the age increased particularly in case of female. The mean for HDL cholesterol was found to be higher in women than

men in all the age groups. The mean value for LDL cholesterol was found to be higher for females in all age groups.

The mean value for TAG also found to be within reference range in men of age group 20-60 yrs. and for females in the age group 40-60 yrs. and >60 yrs. The mean value for LDL cholesterol was also found to be within reference range in both the sexes for all the age groups. For HDL cholesterol the mean value was found to be within reference range that used in our laboratories. No significant differences were observed between most of the groups.

The abnormalities of blood lipids are related mainly to different dietary habits of people, lifestyle, and heredity along with the other factors as we have mentioned in the section of introduction. When we compare our data with some recent studies done on Indian people, we have found that our values did not differ much with the values of those studies^(9, 10). Though it seems lipid levels in Nepalese are on an average less, compared to population abroad, except for triacylglycerols⁽¹¹⁾, it is observed that the values of present study follows a similar pattern as in some of the foreign countries⁽¹²⁾. Probably due to the health consciousness and public awareness regarding the role of dietary habit and lifestyle on the occurrence of heart disease, an uniform pattern of living quality and healthy food habit has put the population of Chitwan and it's surround of Nepal on a similar plateau.

The observed mean value of lipids of our study were within the reference range used in our labs were probably due to the sedentary lifestyle of Chitwan and it's surrounding Nepalese people. However the mean values seem to be similar in comparison with available literature data.

Chitwan is a eastern region of Nepal and CMC (Chitwan Medical College) is main referral centers for the whole Eastern region. Keeping in mind this fact we would like to expect further detailed study among Nepalese population to establish the mean and standard deviation of lipid profile as there is a great variations in dietary habit and life style among Nepalese population.

Table 1:

Parameters	Reference range used in Chitwan Medical College
Total Cholesterol (mg/dl)	150-250 (mg/dl)
T.G	M: 65-170 (mg/dl), and F:45-145 (mg/dl)
LDL	Up to 150 (mg/dl)
HDL	>40 (mg/dl)

Table 2: Serum levels of Total Cholesterol, T.G, LDL and HDL of Male verses Female 20-40 age group.

Parameters	Male	Female	P-value
Total Cholesterol (mg/dl)	150 ± 0.52	161.95±2.66	0.000
T.G	135.40±2.7	97.4±5.85	0.000
LDL	94±1.58	101.62±0.53	0.000
HDL	36.84± 1.16	41.2±1.3	0.001

Values are expressed as mean ± SD (n= 90).

Table 3: Serum levels of Total Cholesterol, T.G, LDL and HDL of Male verses Female 40-60 year age group.

Parameters	Male	Female	P-value
Total Cholesterol (mg/dl)	166.20 ±1.20	184.20±2.77	0.000
T.G	119.80±1.30	110.70±2.25	0.000
LDL	97.82±1.45	113±2.91	0.000
HDL	37.60± 0.54	43.00±1.00	0.000

Values are expressed as mean ± SD (n= 90).

Table 4: Serum levels of Total Cholesterol, T.G, LDL and HDL of Male verses Female >60 year age group.

Parameters	Male	Female	P-value
Total Cholesterol (mg/dl)	163.00 ± 3.39	195.20±1.92	0.000
T.G	102.00±1.58	102.80±5.26	0.001
LDL	97.68±3.82	110.80±3.43	0.000
HDL	40.00±1.00	49.00±1.00	0.000

Values are expressed as mean ± SD (n= 90).

ACKNOWLEDGEMENT:

The authors would like to thank Chitwan Medical College for providing research facilities. Authors are also indebted to all participants in this study for their cooperation.

REFERENCES:

1. Burtis CA, Ashwood ER. Establishment and use of Reference Values. Tietz Textbook of Clinical Chemistry. Chapter 14,3rd Edition, W.B. Saunders Company, Philadelphia U.S.A.1991; 336-56.
2. Mora S, Rifai N, Burring JE, Ridker PM. Fasting compared with nonfasting lipids and apolipoproteins for predicting incident cardiovascular events. Circulation. 2008; 118:993–1001.
3. Total Cholesterol was estimated by Cholesterol Oxidase Method.

4. Triacylglycerol (TAG) was done by Lipase/ G-ol dehydrogenase Method.
5. Direct: non immunological Method was used for determination of High Density Lipoprotein Cholesterol (HDL-C).
6. Mora S, Rifai N, Buring JE, Ridker PM. Comparison of LDL cholesterol concentration by Friedewald calculation and direct measurement in relation to cardiovascular events in 27,331 women. Clin Chem. 2009; 55:888-94.
7. en.wikipedia.org/wiki/Rural_area.
8. en.wikipedia.org/wiki/Urban_area.
9. Goswami K, Bandyopadhyay A. Lipid profile in middle class Bengali people of Kolkata. Ind J Clin Biochem 2003; 18 (2): 127-30.
10. Gupta R, Prakash H, Kaul V. Cholesterol lipoproteins, Triglyceride, Rural-Urban Differences and prevalence of dyslipidemia among males in Rajasthan. J Assoc Physicians Ind 1997; 45:273-9.
11. Sethi KK. Coronary Artery disease in Indians. Cardiology Today 1997; 1(2): 17-21.
12. Yano K. Distribution and correlates of lipids and lipoproteins in elderly Japanese-
13. American men. The Honolulu Heart Programme, Atherosclerosis, Thrombosis and Vascular Biology 1996; 16:1356-64.