

## LIPID PROFILING IN MATHURA POPULATION

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**ABSTRACT**

Asian populations have experienced spurt in chronic diseases later than the western populations. South Asia especially India where infectious diseases are still highly prevalent, has suffered much more after this transition, as the prevalence, incidence and mortality from coronary artery disease (CAD) among them have been reported to be higher than among the western and other Asians. Coronary artery disease (CAD) is a multifactorial disease resulting from interaction among various hereditary, cultural and environment factors. Population specific studies are rare. The present study reports Lipid (total cholesterol and triglycerides), Lipoprotein (HDL, LDL, VLDL) and their concentrations among Mathura populations and discuss the importance of population surveys covering normal healthy individuals for developing policies for coronary heart diseases (CHD) prevention owing to unique genetic make-up of Indian populations.

**KEYWORDS:** CAD, HDL, LDL, VLDL, CHD.**INTRODUCTION**

In human metabolism, lipids are considered as one of the important dietary constituent. The elevated levels of blood lipids especially cholesterol are the major - factors for heart diseases. Each 1% rise in cholesterol is associated with an approximate 2% increase in coronary heart diseases (CHD). Many epidemiological studies have established that LDL is directly proportional and HDL is inversely proportional to CHD. Hyperlipidaemia and lipoproteinemia are responsible for clinical manifestation of atherosclerosis (Goswami and Bandyopdhyay, 2003). The concentration of blood lipid in an individual or population is modulated overwhelmingly by factors such as social, behavioural, physiological and genetics. It is estimated that over 60% of the variability in serum lipids is genetically determined and most of the variation being due to polygenic influences. Interaction between the later and environmental factors is probably the commonest cause of hyperlipidemia in the general population (Thompson, 1990).

CHD is the third largest cause for clinical mortality in India after infectious diseases and tuberculosis. Several researchers revealed that the Indians, because of high serum cholesterol lipoprotein (a), Lp(a), insulin resistance syndrome, vitamin E and vitamin C deficiency and genetic make-up are prone to CHD and diabetes (Bhatnagar et al., 1995). Further, Indians are susceptible to atheroma 15–20 years ahead of the west

and they develop atheroma even at lower concentration of lipids than western people Swamy et al., 1989). So, there is a need to develop guidelines and standards for lipid and lipoprotein concentration based on Indian populations. But we still depend upon western standards to diagnosis hyperlipidemia in clinical manifestation of atherosclerosis. In spite of Indians greater genetic and cultural diversity only few populations are covered until now and data on lipid variation is very scanty. So, keeping this in view, lipid (TC and TG), lipoprotein (HDL, LDL and VLDL) profiles in Mathura populations is presented.

**MATERIAL AND METHODS**

A sum total of 200 (Males= 100 and Females 100) individuals aged between 20 and 60 years were selected from Mathura. 5 ml intravenous blood was drawn from each individual in the general resting position after overnight fasting in vacutainers. An informed consent was taken from the volunteers. Age, height weight and blood pressure were recorded habits of the subjects were obtained using a questionnaire. The past history of each person along with family history was tracked and no cases of M.I were detected. The sample blood of individuals was tested at the Biochemistry laboratory, Sanskriti University Mathura. Serum total cholesterol levels was determined by enzymatic (CHOD-PAP) colorimetric method (Allain et al., 1974) and triglycerides by enzymatic GPO-PAP) method (Jacobs and VanDenmark, 1960). HDL-cholesterol and LDL-

cholesterol were estimated using precipitant (Gordon and Gordon, 1977) and Friedwald formula (Freidwald et al. 1972). Lipid Triad Index was calculated using the formula TCXTG/HDL-C (Goswami and Bandopdhyay, 2003). Statistical analyses of data such as range, mean and standard deviation were carried out using MS excel software.

## RESULT AND DISCUSSION

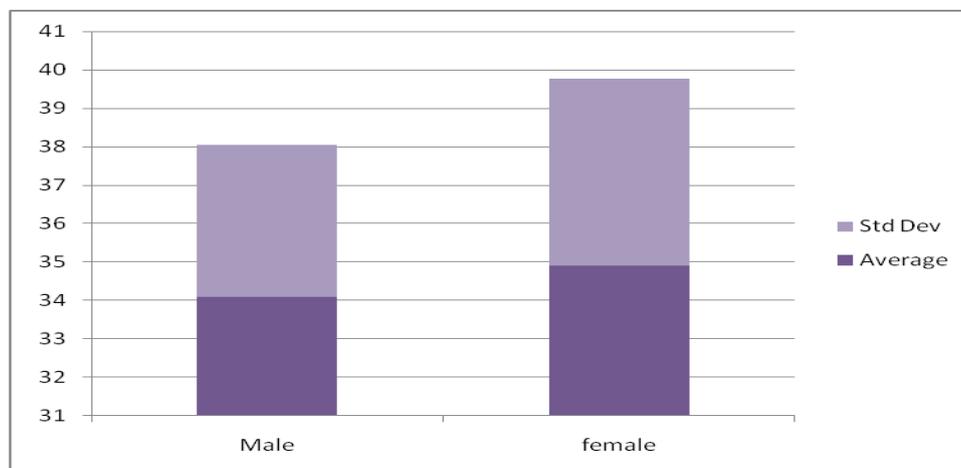
In a study conducted at Sanskriti Ayurvedic Medical College & Hospital ,Mathura Random Patients 30 Male and 30 Female were taken. The Anthropometric data is given in the table below.

**Table-1: Anthropometric Data.**

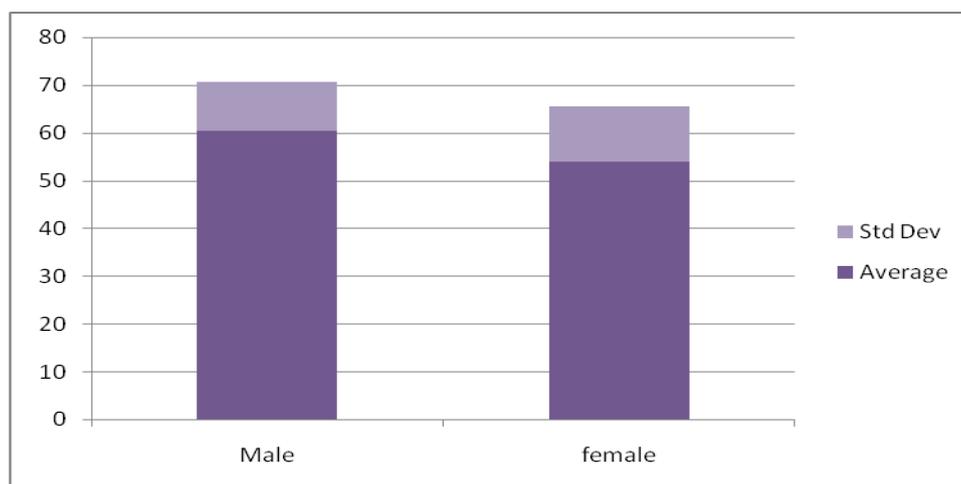
Parameter	Male	Female
Age (Years)	34.1±3.94	34.9±4.86
Weight (Kg)	60.41±10.21	54.02±11.52
Height (Cm)	170.42±6.13	165.42±6.71
Blood pressure (mm/Hg)(Systolic)	126±11.3	118.24±14.3
Blood pressure (mm/Hg)(Diastolic)	76.2±9.4	67.7±8.3
Body mass index(BMI)	23.49±3.2	26.4±4.5

The age of all the subjects undertaken for study was between 20 to 40 years. The mean of the age of the female population was insignificantly high as compared to male population. The mean of the weight of male population was significantly high as compared to female population The same trend was observed for height .The Systolic and Diastolic blood pressure of the males were

found to be increased as compared to females however none of the subjects in this study were hypertensive or hypotensive .The BMI calculated from height and weight concluded that none of the patient were obese or overweight and BMI of the female population was insignificantly high as compared to male population. The data is represented in graphs below:



**Figure 1: Age.**



**Figure 2: Weight.**

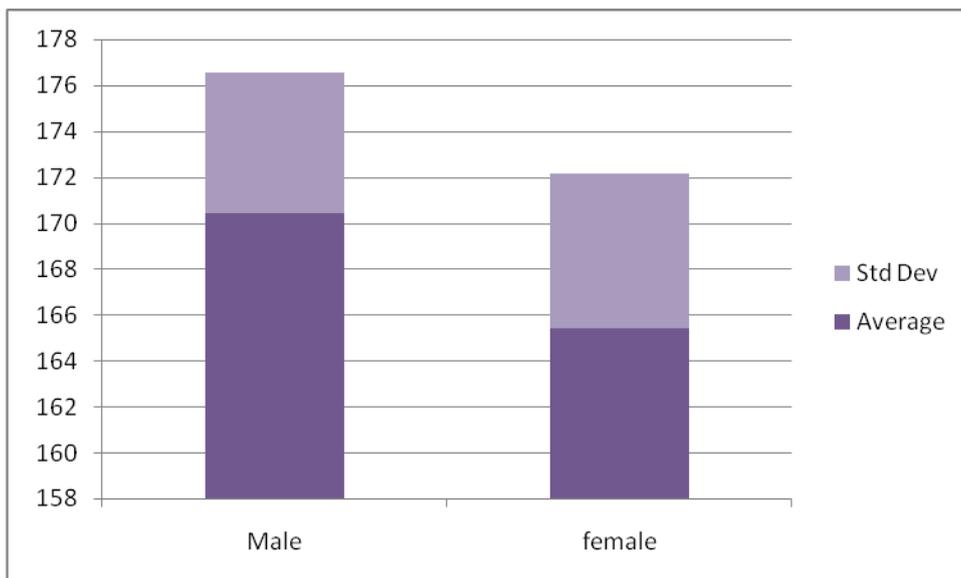


Figure 3: Height.

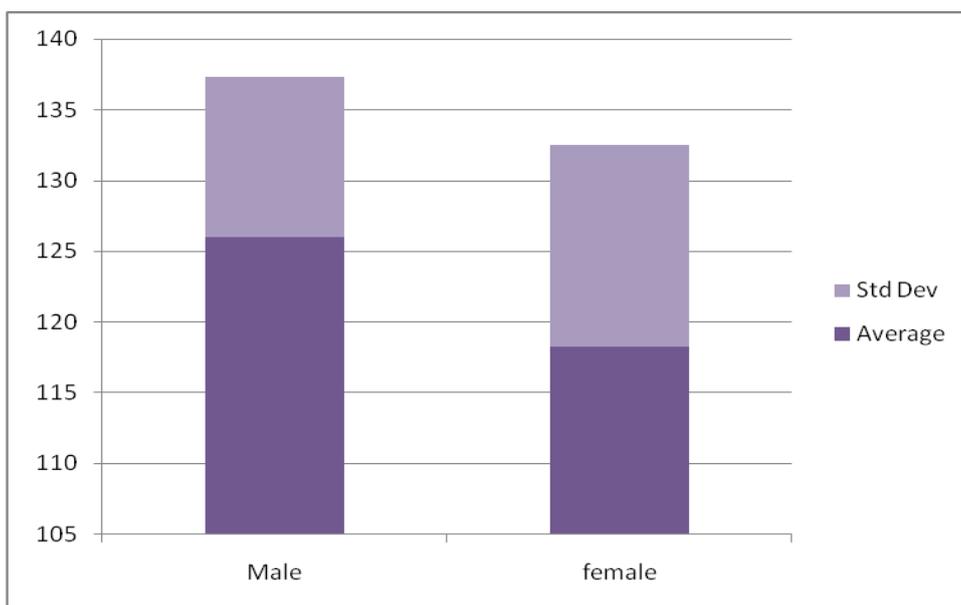


Figure 4: Systolic Blood pressure.

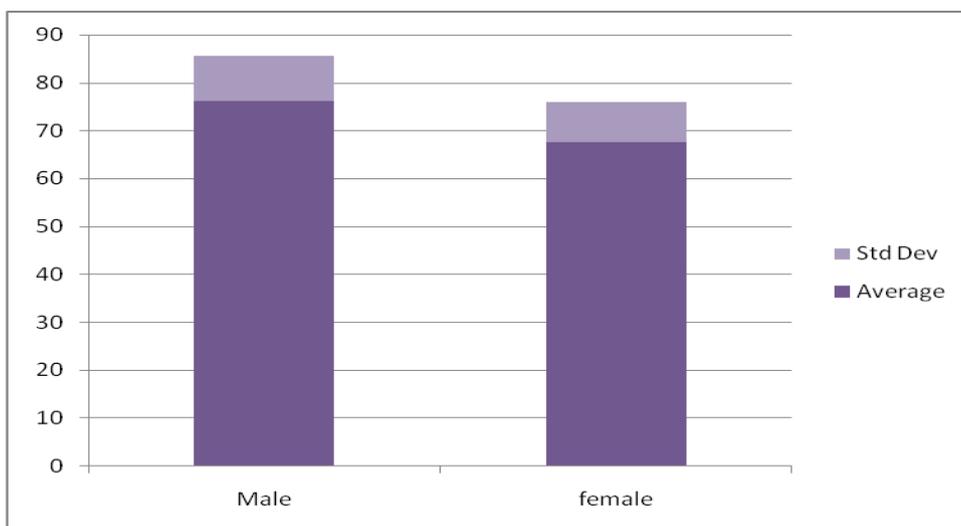
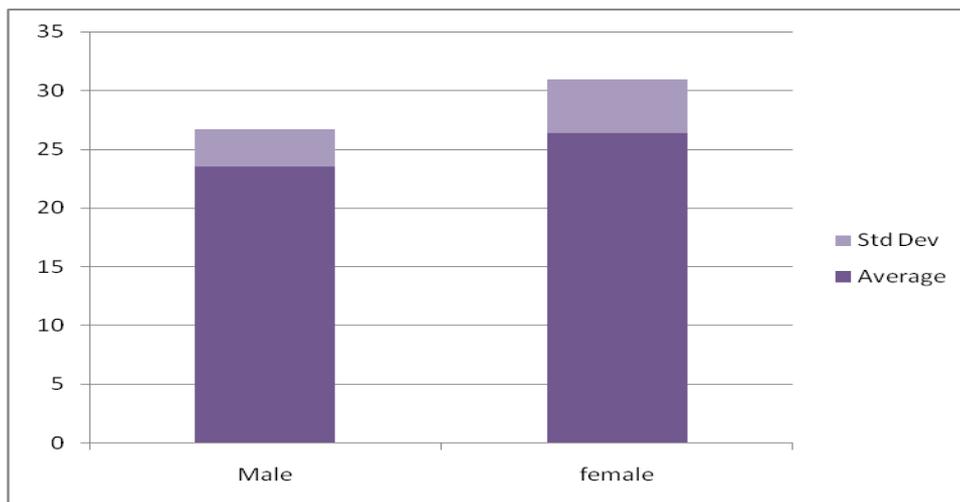


Figure 5: Diastolic Blood pressure.



**Figure 6: Body Mass Index**

The mean and standard deviation of various Lipid Profiles in Mathura region of males and females taken randomly of age below 40years are given in table below:-

**Table 2:**

Parameter	Male	Female
Total Cholesterol	191.25± 50.93	189.75± 42.18
HDL Cholesterol	43.89 ± 7.85	51.43 ± 11.44
Triglyceride	169.49 ±61.65	138.64 ± 59.10
LDL	126.48 ± 37.89	128.41 ± 39.91
VLDL	33.9 ± 12.09	27.72 ± 11.82

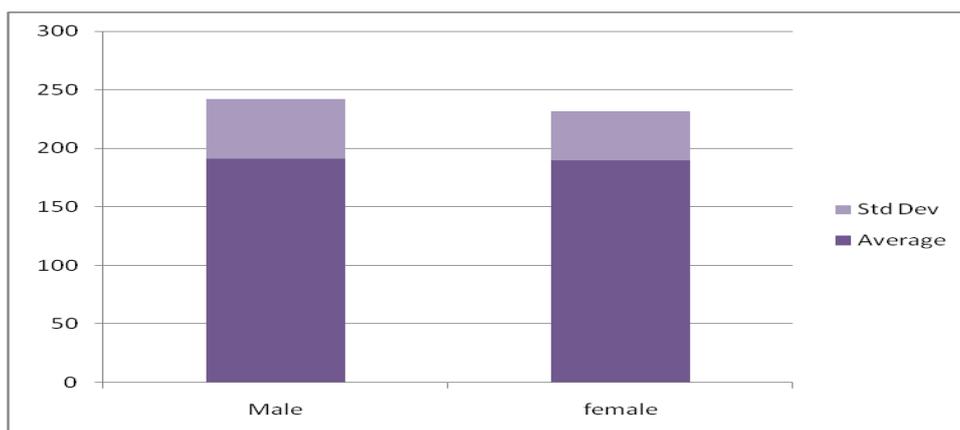
The graphs obtained by comparing the values of Mean and Standard deviation of various Lipid Profile in Mathura region of male and female population are given below:-

**Total Cholesterol**

In our study the mean value of total cholesterol was found to be 191.25mg/dl in males. In an earlier study done in West Bengal, mean value of Total Cholesterol in Males (36 in no.) in the age group 21 – 30 years was found to be 169.6±31.4 mg/dl and in age group 31-40 years (132 in no.) the value was 178.4±31.7 mg/dl

(K.Goswam and Bandyopadhyay; 2003). In another study in Gujrat, the mean value of Total Cholesterol in age group 16-45 years was found to be 179.27±37.50 mg/dl (Jahla *et.al.*1998). In another study from south India (Shanmugasundaram *et.al.*1998), the mean value of Total Cholesterol was found to be 217.7±41.9 mg/dl. The Total Cholesterol in our study was found to be lower than South Indian Population. It was found to be higher than Bengali and Gujrati population.

In our study the mean value of total cholesterol was found to be 189.75mg/dl in females. In an earlier study done in West Bengal, mean value of Total Cholesterol in Females (34 in no.) in the age group 21 – 30 years was found to be 168.1±27.1 mg/dl and in age group 31-40 years (85 in no.) the value was 175.5±47.7 mg/dl (K.Goswam and Bandyopadhyay 2003).In another study in Gujrat, the mean value of Total Cholesterol in females in age group 16-45 years was found to be 170.46±30.66 mg/dl (Jahla *et.al.*1998). In another study from south India (Shanmugasundaram *et.al.*1998) the mean value of Total Cholesterol was found to be 211.5±34.8 mg/dl. The Total Cholesterol in our study was found be lower as compared to south Indian population but higher as compared to Bengali and Gujrati female population.



**Figure 7: Total Cholesterol.**

### HDL CHOLESTEROL

In our study the mean value of HDL Cholesterol was found to be 43.83mg/dl in males. In an earlier study done in West Bengal, the mean value of HDL Cholesterol in Males (36 in no.) in the age group 21 – 30 years was found to be 49.5±10.1 mg/dl and in age group 31-40 years (132 in no.) the value was 52.2±11.6 mg/dl (K.Goswam and Bandyopadhyay; 2003). In another study in Gujrat, the mean value of HDL Cholesterol in age group 16-45 years was found to be 44.07±37.50 mg/dl (Jahla *et.al.*1998). In another study from south India (Shanmugasundaram *et.al.*1998) the value of HDL Cholesterol was found to be 48.74±30.66 mg/dl. The HDL Cholesterol in our study was lower than Gujrati, South Indian and Bengali Population in Males.

In our study the value of HDL Cholesterol was found to be 51.43 mg/dl in Females. in earlier study in West Bengal. Mean value of HDL Cholesterol in Females (34) of Age groups 21 – 30 years was found to be 57.5±8.9 mg/dl and in age group 31-40 years (85) the value was 54.0±10.8 mg/dl (K.Goswam and Bandyopadhyay; 2003). In another study at Gujrat the mean value of HDL Cholesterol in age group of 16-45 years 48.74±30.66 mg/dl (Jahla *et.al.*1998) in another study from south India (Shanmugasundaram *et.al.*1998). The value of HDL Cholesterol was found to be 66.4±11.1 mg/dl. The HDL Cholesterol in our study was lower than Bengali and South Indian female Population but higher than Gujrati female population.

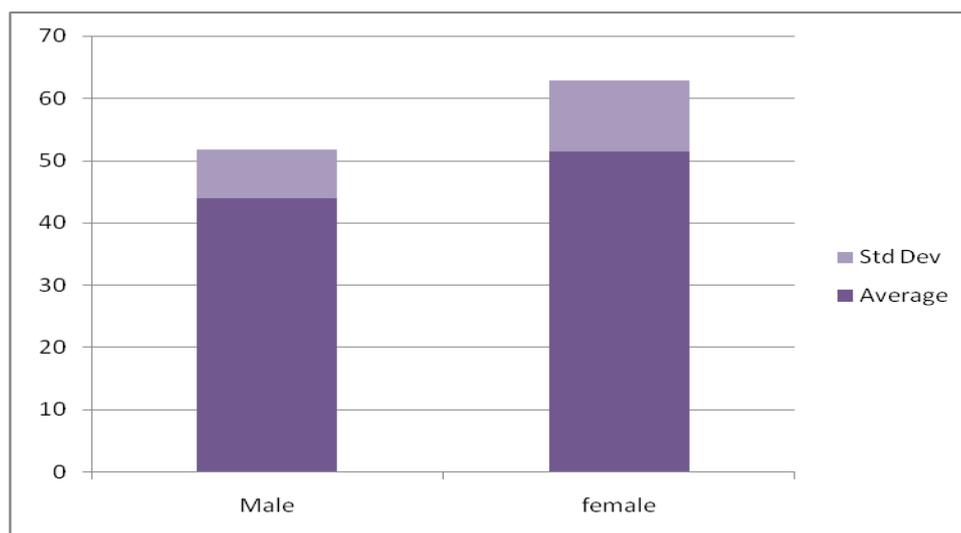


Figure 8: HDL Cholesterol.

### Triglyceride

In our study the value of Triglyceride was found to be 169.49 mg/dl in Males in earlier study in West Bengal. Mean value of Triglyceride in Males (36) of Age groups 21 – 30 years was found to be 138.1±37.2 mg/dl and in age group 31-40 years (132) the value was 136.2±40.1 mg/dl (K.Goswam and Bandyopadhyay; 2003 ). In another study at Gujrat the mean value of Triglyceride in age group of 16-45 years 119.56±62.75 mg/dl (Jahla *et.al.*1998) in another study from south India (Shanmugasundaram *et.al.*1998). The value of Triglyceride was found to be 139±29 mg/dl. The Triglyceride in our study was higher than Gujrati, South Indian Population and Bengali Population in Males.

In our study the value of Triglyceride was found to be 138.64 mg/dl in Females in earlier study in West Bengal. Mean value of Triglyceride in Females (34) of Age groups 21 – 30 years was found to be 100.7±39.4 mg/dl and in age group 31-40 years (85) the value was 130.5±38.6 mg/dl (K.Goswam and Bandyopadhyay; 2003).In another study at Gujrat the mean value of Triglyceride in age group of 16-45 years 100.19±46.91mg/dl (Jahla *et.al.*1998) in another study

from south India (Shanmugasundaram *et.al.*1998). The value of Triglyceride was found to be 128.0±22 mg/dl. The Triglyceride value in our study was higher than Gujrati Bengali and South Indian population.

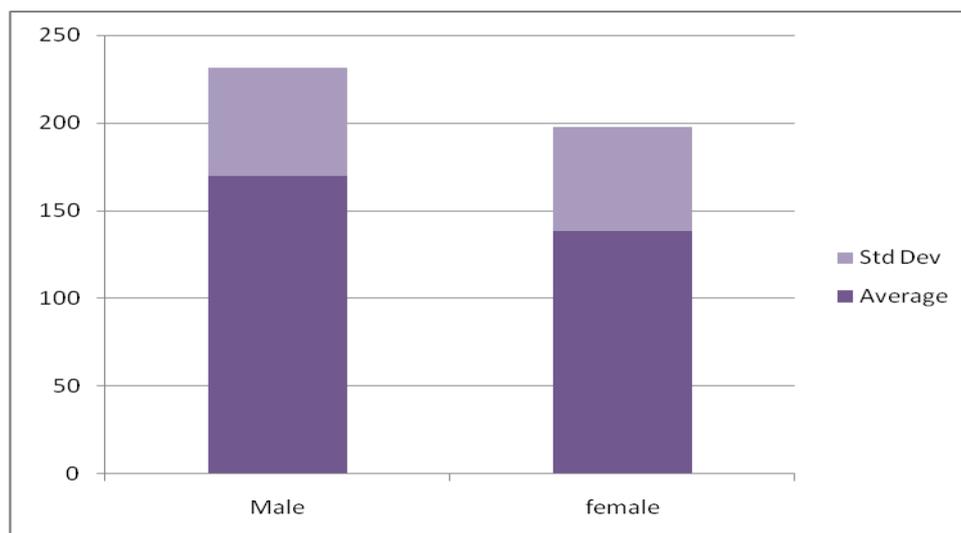


Figure 9: Triglyceride.

### VLDL Cholesterol

In our study the value of VLDL was found to be 33.9 mg/dl in Males in earlier study in West Bengal. Mean value of VLDL in Males (36) of Age groups 21 – 30 years was found to be  $23.3 \pm 5.8$  mg/dl and in age group 31-40 years (132) the value was  $22.0 \pm 6.4$  mg/dl (K.Goswam and Bandyopadhyay; 2003). In another study at Gujrat the mean value of VLDL in age group of 16-45 years 37.50 mg/dl (Jahla *et.al.*1998) in another study from south India (Shanmugasundaram *et.al.*1998). The value of VLDL was found to be  $36.1 \pm 20.0$  mg/dl. The VLDL in our study was lower than South Indian Population and Bengali Population of males but higher as compared to Bengali population.

In our study the value of VLDL was found to be 27.72 mg/dl in Females in earlier study in West Bengal. Mean value of VLDL in Females (34) of Age groups 21 – 30 years was found to be  $16.4 \pm 6.2$  mg/dl and in age group 31-40 years (85) the value was  $21.1 \pm 6.0$  mg/dl (K.Goswam and Bandyopadhyay; 2003). In another study at Gujrat the mean value of VLDL in age group of 16-45 years  $30.66 \pm 19.51$  mg/dl (Jahla *et.al.*1998) in another study from south India (Shanmugasundaram *et.al.*1998). The value of VLDL was found to be  $32.1 \pm 15.3$  mg/dl. The value of VLDL our study was lower than Gujrati Population and South Indian female Population but higher than Bengali female population.

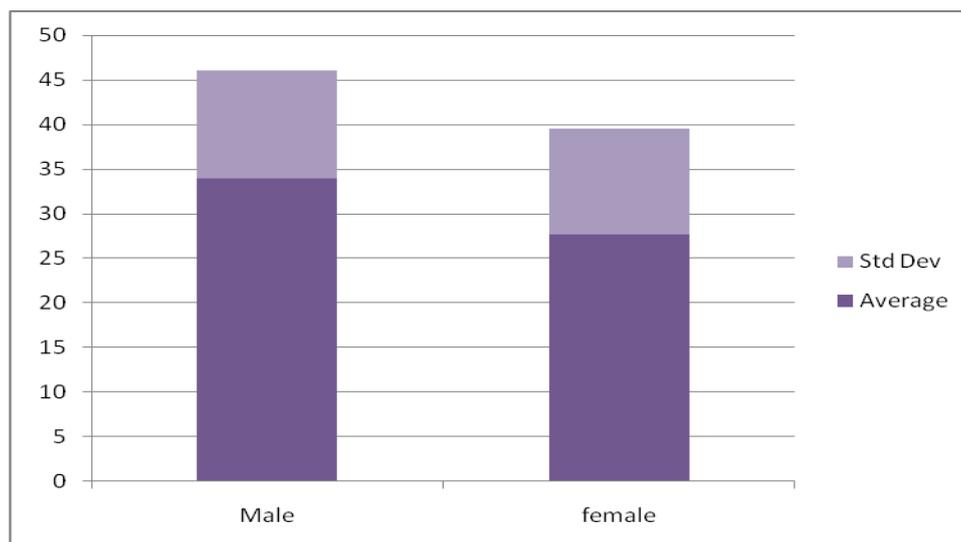


Figure 10: VLDL.

### LDL Cholesterol

In our study the value of LDL was found to be 126.48 mg/dl in males in earlier study in West Bengal. Mean value of LDL in males (36) of Age groups 21 – 30 years was found to be  $97.8 \pm 27.1$  mg/dl and in age group 31-40 years (132) the value was  $104.2 \pm 28.7$  mg/dl (K.Goswam

and Bandyopadhyay; 2003). In another study at Gujrat the mean value of LDL in age group of 16-45 years  $109.28 \pm 37.50$  mg/dl (Jahla *et.al.*1998) in another study from south India (Shanmugasundaram *et.al.*1998). The value of LDL was found to be 118.3mg/dl. The value of

LDL in our study was higher when compared with the population of same age group in other areas.

In our study the value of LDL was found to be 128.41 mg/dl in females in earlier study in West Bengal. Mean value of LDL in Females (34) of Age groups 21 – 30 years was found to be 94.2±42.0 mg/dl and in age group 31-40 years (85) the value was 100.4±36.7 mg/dl

(K.Goswami and Bandyopadhyay; 2003). In another study at Gujrat the mean value of VLDL in age group of 16-45 years 113±30.66 mg/dl (Jahla *et al.* 1998) in another study from south India (Shanmugasundaram *et al.* 1998). The value of VLDL was found to be 118.3±30.12 mg/dl. The value of LDL in our study was higher than Gujrati Population, South Indian Population and West Bengali Population of Females.

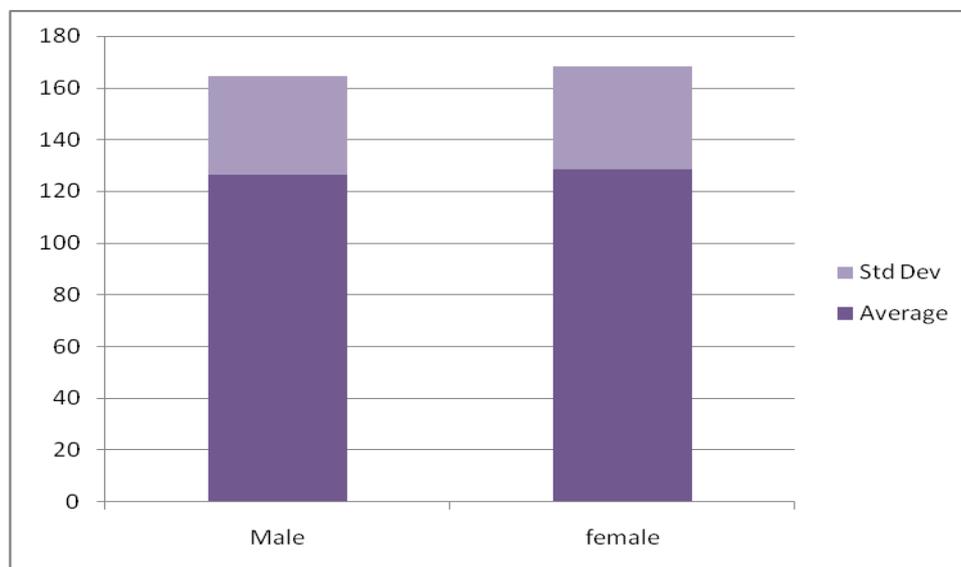


Figure 11: LDL.

## SUMMARY AND CONCLUSION

Regular health exams and tests can help find problems before they start. They also can help find problems early, when your chances for treatment and cure are better. By getting the right health services, screenings, and treatments, we are taking steps that help your chances for living a longer, healthier life. Your age, health and family history, lifestyle choices (i.e. what you eat, how active you are, whether you smoke), and other important factors impact what and how often you need healthcare. The present study was undertaken to find out initiation of diseases in Mathura population by lipid profile screening of individuals. The results were summarized below: It was observed that total cholesterol was high in males as compared to females. The mean of total cholesterol of both the population was higher when compared with other population studies. The HDL cholesterol in females was high as compared to male population. The HDL cholesterol levels in the males of the presently studied population were low when compared with other population. The average of female population was low as compared to most of the previous studies. The triglyceride levels were high in males as compared to females and values of male and female population were higher when compared with similar age groups of previously studied population. The LDL values were slightly high in females when compared to males and LDL values in both the genders were high when compared with previous studies. The present study observed higher average of total cholesterol, triglycerides

and LDL cholesterol and low average of HDL cholesterol when compared with other Indian population studies. The main Drawback of the study was that sample size was low and larger sample size is required in order to find out the reference range in the above region.

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