The present study attempts to investigate the various changes in lipid profiles in females. The study was conducted on normal healthy, hypertensive, diabetic, obese and snuff user female subjects in relation to age, and sex steroid hormonal changes in menstruating, ovulatory and menopausal phases. The various biochemical estimations i.e. plasma glucose, serum TC, TG, HDL, LDL, VLDL, TC/HDL and LDL/HDL ratio(s) (serum lipid profile), serum estradiol and serum progesterone concentrations in the above mentioned female subjects in the age group of 18-35 yrs, 36-50 yrs and above 50 yrs were carried out. Also in the present study we have tried to find out the various changes in Apo A-I and Apo B in menopausal (above 50 yrs) female (control healthy, diabetic and obese) subjects in relation to serum HDL, VLDL & LDL concentrations and sex steroid hormonal changes.

(1) In the present study in control healthy female subjects it is seen that there is (approximately 10 ng/l & 2 ng/ml) increase in estradiol and progesterone levels (respectively) in 18-35 yrs as compared to 36-50 yrs suggesting that the decreased LDL in ovulatory phase may be due to the increased concentration of sex steroids in younger females as compared to middle age females.

(2) In the present study in the control healthy female subjects there is increase in serum TC and LDL in menopause females as compared to menstruating females (18-35 yrs & 36-50 yrs) and a decrease in serum HDL in menopause females in comparison to younger females (18-35 yrs). The increase in various parameters with respect to age suggests that increase in serum TC and TC/HDL ratio with an increase in age in females of kheda district where the study was undertaken may lead to the high incidence of CHD and it could possibly be primarily due to an increase in weight or due to increase in age along with changes in the sex steroid hormonone status.

(3) In the present study in diabetic female subjects it is seen that there is an increase in the TC, TG, LDL and VLDL and no change in HDL but a
significant increase in TC/HDL, LDL/HDL ratio(s) in menstruating subjects but not in menopause subjects in comparison to age matched control subjects suggesting that this inverse relationship may result from differences in the activity of tissue lipoprotein lipase.

(4) Our results in diabetic female subjects in relation to the steroid hormonal changes and age matched control or menopausal diabetic subjects versus menstruation or ovulatory diabetic subjects, suggests that there is a relationship between LP lipase stimulation in NIDDM under insulin therapy, which contributes to the reduction of VLDL and TG.

(5) In the present study it is possible that the lack of change seen in obese ovulatory subjects and decrease in the serum HDL in female (18-35 yrs) subjects and increase in serum VLDL in female (36-50 yrs) subjects as compared to age matched controls and diabetic subjects may be due to either genetic or environmental factors, especially the characteristics of the diet.

(6) The results of the present study in obese subjects show that as the age increases there is increase in glucose, TC and TG. This could be primarily due to weight gain and increasing fatness as the females get older, or due to the changes in the sex steroid hormone metabolism.

(7) In our results in obese menopause (above 50 yrs) subjects in comparison to obese menstruating subjects (both phases, 36-50 yrs) there is increase in LDL with decrease in endogenous serum estradiol. However, in comparison to obese female (18-35 yrs) subjects, the obese menopausal female (above 50 yrs) subjects depicts no significant change in the serum LDL or VLDL which could be related to deep abdominal fat or subcutaneous trunk fat or total body fat changes in various obese menopause subjects.

(8) In the present study there is (i) an increase in the TC and TG levels in menopausal hypertensive subjects in relation to control subjects (age
matched). (ii) There is an increase in the levels of TC, LDL, VLDL, LDL/HDL ratio, and decrease in sex steroids in hypertensive menopausal subjects in relation to menstruating hypertensive subjects in both phases. (iii) Increase in glucose TC, TG, HDL, VLDL levels, and TC/HDL, LDL/HDL ratio(s) as the age progresses in the hypertensive female subjects suggest that these changes may be either due to environmental factors, especially the characteristics of diet and exercise, due to the drug treatment schedule in relation to the sex steroid changes or due to weight gain as a result of increasing fatness as the age progresses.

(9) Our study on various parameters in snuff users shows an increase in TC, TG, LDL, and increase in the TC/HDL and LDL/HDL ratio(s) as the age increases. Therefore it is suggested that the snuff user females are equally prone to CAD as the female smokers. However, no significant change in serum HDL in snuff user females is seen as the age increases. This may probably be due the quantity of tobacco absorbed in to the body of the snuff users which is expectedly less as compared to the amount of tobacco inhaled during smoking in females.

(10) In the present study in snuff users in comparison to control subjects it is seen that there is decrease in TC and LDL (36-50 yrs) and no change in TC & LDL (above 50 yrs), increase in TG (36-50 yrs) and decrease in TG (above 50 yrs), no change in VLDL (36-50 yrs) and increase in VLDL (above 50 yrs), and this suggests that these variations may probably be due to the method in which the tobacco is consumed, i.e., by smoking or by using snuff. Another reason may be because of the genetic, dietary and other variables in the present population studied.

(11) In the present study in the menopausal subjects there is an increase in TC and this may be due an increase in LDL which results from reduction in LDL receptor activity and the decrease in HDL in menopausal females probably is because of decrease in HDL2. There is no change in HDL, LDL, Apo A-I and Apo B, but a significant increase in VLDL in diabetic or obese subjects in comparison to control menopausal subjects
suggesting that this could be due to LDL representing a 'remnant' of VLDL catabolism in which the TG is virtually eliminated and also not all VLDL particles are destined to complete the cascade conversion to LDL.

The present study has tried to answer a number of questions in relation to change in plasma glucose, serum lipid profile and sex steroidal changes in various age groups in menstruating, ovulatory and menopause phases, while some questions have been answered successfully, others are still unsolved. Some leads have been obtained which because of constraints of infrastructural facilities in the laboratory could not be pursued further. Facilities for use of gradient-gel electrophoresis if made available could go a long way in unravelling the unresolved problems.