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EVALUATION OF SERUM LIPID PROFILE IN POSTMENOPAUSAL WOMEN

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ABSTRACT

Background: The serum lipid profile of postmenopausal women often undergoes notable changes due to the hormonal shifts that occur during and after menopause. These changes can have implications for cardiovascular health and overall well-being. **Objective:** To assess serum lipid profile in postmenopausal women. **Methodology:** This cross-sectional descriptive study was carried out at Department of Physiology of Rajshahi Medical College from July 2018 to June 2019. Where 200 healthy postmenopausal women aged 50-70 years in Rajshahi city were included as sample size. The healthy adults who were fulfill the inclusion criteria was enrolled in this study. After taking informed consent, complete history taking and physical examination was done and recorded in a preformed data sheet. **Results:** 80% of postmenopausal women have abnormal serum triglyceride level and 20% of postmenopausal women have normal serum triglyceride level out of 200 postmenopausal women. 95.5% of postmenopausal women have low serum HDL-C level (<50 mg/dl) and 4.5% of postmenopausal women have normal serum HDL-C level (>50mg/dl). 11.0% of postmenopausal women have abnormal serum LDL-C level and 89.0% of postmenopausal women have normal serum LDL-C level out of 200 postmenopausal women. The mean serum total cholesterol level in group- I of postmenopausal women were 194.14±37.49 mg/dl and group- II of postmenopausal women were 195.10±31.41 mg/dl, which does not differ significantly. **Conclusion:** Increased LDL-C level (11%), increased total cholesterol level (9.5%), low HDL-C level (95.5%) in postmenopausal women. TG level were increasing with age of postmenopausal women and it was statistically significant. LDL-C, total cholesterol, HDL-C level does not differ significantly among different age groups of postmenopausal women. There was mixed type of hyperlipidemia was present in postmenopausal women.

KEYWORDS: Serum lipid profile, serum LDL, postmenopausal women.

INTRODUCTION

Menopause signifies the permanent halt of menstruation, resulting from the cessation of ovarian follicular activity. This transition induces various hormonal shifts in women, altering lipid metabolism and elevating the risk of coronary artery disease (CAD).[1] Before the age of 50, CAD incidence is lower in women, but it converges with that of men afterward.[2] With increasing life expectancy, women now spend more years in the post-menopausal stage; in India, over 60 million women are aged above 55.[3] Understanding menopause-related health issues is crucial for promoting women's well-being during this phase.

The upsurge in cardiovascular disease risk is associated with multiple factors like hypertension, diabetes, dyslipidemia, weight gain, aging, sedentary lifestyle, mental stress, smoking, and alcohol consumption.[4] In the United States, over 500,000 women die from cardiovascular disease, with about half of these cases attributed to coronary artery disease (CAD). Although CAD incidence is initially higher in men, it significantly rises in women after menopause.[5] Hormonal changes post-menopause, including decreased estrogen and increased luteinizing and follicular stimulating hormones, exert substantial effects on plasma lipid and lipoprotein metabolism in postmenopausal women.

OBJECTIVE

To assess serum lipid profile in postmenopausal women.

METHODOLOGY

This cross-sectional descriptive study was carried out at Department of Physiology of Rajshahi Medical College

from July 2018 to June 2019. Where 200 healthy postmenopausal women aged 50-70 years in Rajshahi city were included as sample size.

The healthy adults who were fulfill the inclusion criteria was enrolled in this study. After taking informed consent, complete history taking and physical examination was done and recorded in a preformed data sheet.

After 12 hours over night fasting by all the study subjects 4 ml of fasting venous blood sample were collected from the median cubital vein by disposable plastic syringe with all aseptic precaution. The needle got detached from the nozzle and blood were transfered immediately into dry, clean test tube with a gentle push to avoid haemolysis. The test tube were kept in standing position till the formation of clot. Centrifuging the blood at 3000 rpm for 5 ms, serum were separated and all the biochemical tests were carried without delay.

The obtained data was analyzed by using a software statistical package for the social science (SPSS version 22). Results of the analysis was expressed as mean standard deviation. Unpaired t-test was employed for the statistical analysis of data to find out significant variation among this group. P-value less than 0.05 was taken as the significant value.

RESULTS

According to the Figure-1 postmenopausal women were divided into two age groups. Group-I was considered from 50 years to 60 years. Number of respondents in group-I was 76%. Group-II was considered from 61 years to 70 years. Number of respondents in group-II was 24%.

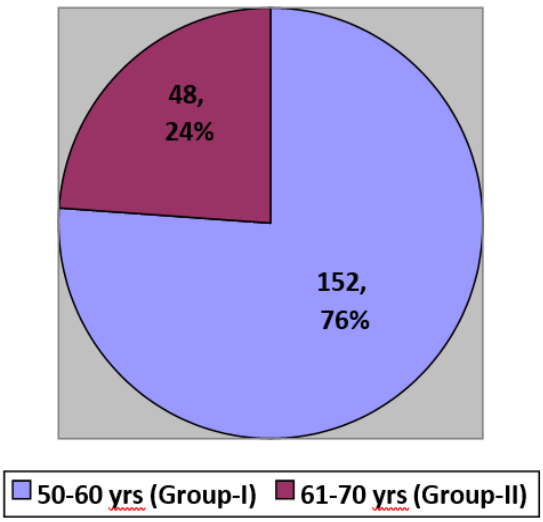

Figure 1: Distribution of age among postmenopausal women.

Figure-2 shows 80% of postmenopausal women have abnormal serum triglyceride level and 20% of postmenopausal women have normal serum triglyceride level out of 200 postmenopausal women.

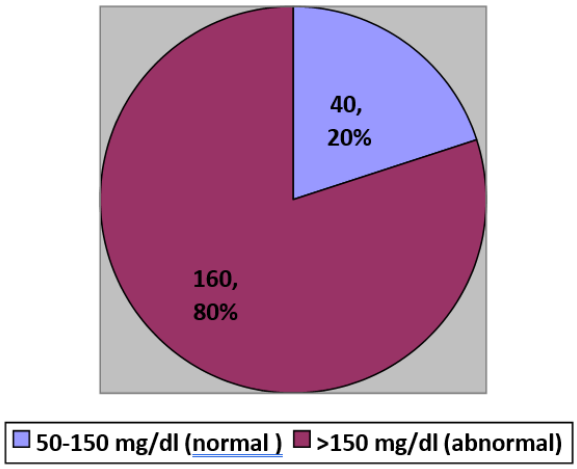

Figure-2: Frequency of serum triglyceride level in postmenopausal women (n=200)

Figure-3 shows out of 200 postmenopausal women, 9.5% of postmenopausal women have abnormal serum total cholesterol level and 90.5% of posmenopausal women have normal serum total cholesterol level.

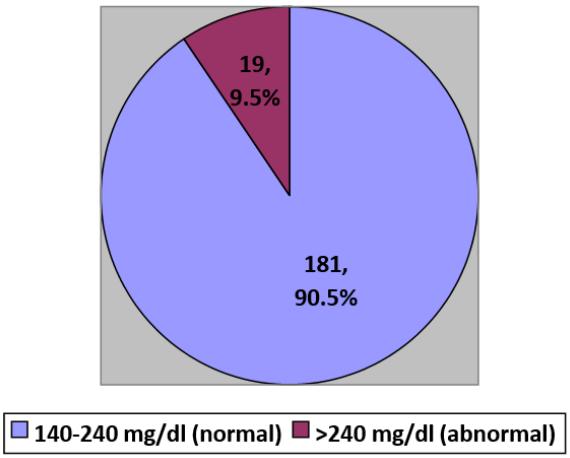

Figure-3: Frequency of serum total cholesterol level in postmenopausal women (n=200)

Figure-4 shows out of 200 postmenopausal women, 95.5% of postmenopausal women have low serum HDL-C level (<50 mg/dl) and 4.5% of postmenopausal women have normal serum HDL-C level (>50mg/dl).

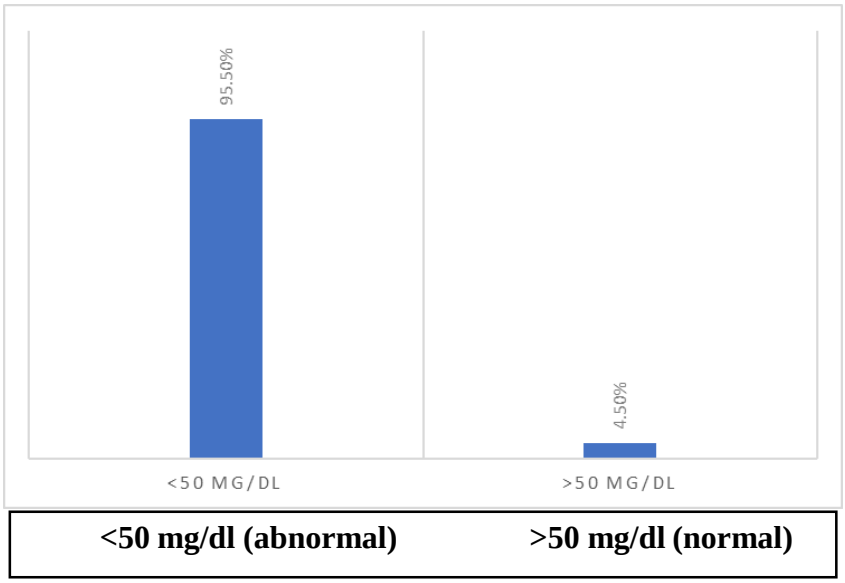

Figure-4: Frequency of serum HDL-C level in postmenopausal women (n=200)

Figure-5 shows 11.0% of postmenopausal women have abnormal serum LDL-C level and 89.0% of postmenopausal women have normal serum LDL-C level out of 200 postmenopausal women.

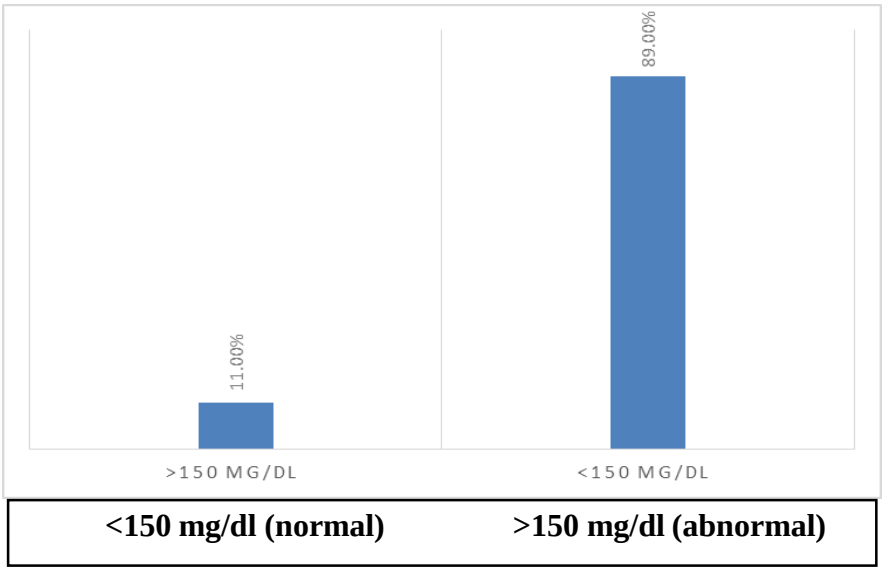

Figure 5: Frequency of serum LDL-C level in postmenopausal women (n=200)

Table-I shows serum triglyceride level in different age group of postmenopausal women. The mean serum triglyceride level in group-I of postmenopausal women were 235.85±91.78 mg/dl and it increased to 270.00±100.36 mg/dl in group-II of postmenopausal women which was statistically significant (p=0.029).

Table I: Serum triglyceride level in different age groups of postmenopausal women.

Age group			
Parameter	50-60 yrs (N=152) (mean±SD)	61-70yrs (N=48) (mean±SD)	P-value
Fasting serum triglyceride level in mg/dl	235.85±91.78	270.00±100.36	0.029s

s=Significant.

The test of significance was calculated using unpaired independent t-test.

Table-II shows serum total cholesterol level in different age group of postmenopausal women. The mean serum total cholesterol level in group- I of postmenopausal women were 194.14±37.49 mg/dl and group- II of postmenopausal women were 195.10±31.41 mg/dl ,which does not differ significantly.

Table II: Serum total cholesterol level in different age groups of postmenopausal women.

Parameter	Age group		
	50-60 yrs (N=152) (mean±SD)	61-70 yrs (N=48) (mean±SD)	P-value
Fasting serum total cholesterol level in mg/dl	194.14±37.49	195.10±31.41	0.873 ns

ns=Not significant.
The test of significance was calculated using unpaired independent t-test.

DISCUSSION

The present study conducted in 200 postmenopausal women in Rajshahi city. Fasting lipid profile in postmenopausal women showed significant dyslipidemia (any one or more parameter out of TG, HDL-C, TC, LDL-C being abnormal). Commonest type of abnormality observed was Low HDL-C (95.5%) and second commonest was abnormal TG level (80%). Remaining have abnormal total cholesterol were (9.5%) respondents and abnormal LDL-C were (11%) respondents.

Our study revealed clear evidence that, 95.5% postmenopausal women had significant decrease in HDL-C level. This was in agreement with the findings detected by the following studies-Chaoji, SA. et al., (2015) detected that low HDL-C level among (89%) of postmenopausal women.[6] Billah, SMB. et al., (2018) detected low HDL-C level among 96.88%) of postmenopausal women.[7] KS premkumar, DR. et al., (2017) detected low HDL-C level among (94.1%) of postmenopausal women.[8] Jahan, MS. et al., (2016) detected low HDL-C level among (96%) of postmenopausal women.[9] Jesmin, S. et al., (2013) detected low HDL-C level among (76.81%) of postmenopausal women.[10]

Bhagya, V. et al., (2011), Bade, G. et al., (2014), Das, J. et al., (2013), Usoro, C.A.O. et al., (2006), IGWEH, JC. et al., (2005), Sapkota, AS. et al., (2015), Mohammad, FM. et al., (2017), Kanwar, G. et al., (2014), all of their study showed, there were statistically significant low HDL-C level among postmenopausal women.[11-18]

On the contrary, study by Kulkarni, MD. et al., (2014), Pardhe, BD. et al., (2017), Shenoy, R. et al., (2015), Ifueko, OD. et al., (2013) were not compatible to the present study.[19-22]

The present study showed that, no significant difference of fasting HDL- C level in different age groups of postmenopausal women in Rajshahi city.

The present study revealed clear evidence that, 80% of postmenopausal women had significant increase in fasting TG level. This was in agreement with the findings detected by the following studies-

Billah, SMB. et al., (2018), detected that high TG level among (51.56%) of postmenopausal women.[7] Chaoji, SA. et al., (2015) detected high TG level among (33%) of postmenopausal women.[6] KS Premkumar, DR. et al., (2017) detected high TG level among (23.5%) of postmenopausal women.[8] Jahan, MS. et al., (2016) detected high TG level among (51%) of postmenopausal women.[9] Jesmin, S. et al., (2013) detected high TG level among (38.12%) of postmenopausal women.[10]

Bhagya, V. et al., (2011), Bade, G. et al., (2014), Das, J. et al., (2013), Sapkota, AS. et al., (2015), Mohammad, FM. et al., (2017), Pardhe, BD. et al., (2017), Shenoy, R. et al., (2015), Ifueko, OD. et al., (2013), similar to the present study, all of their study showed, there were statistically significant higher level of TG among postmenopausal women.[11-13,16-17,20-22]

According to Shenoy, R. et al., (2015), the postmenopausal women, there is increased fat accumulation and increased release of free fatty acids into the circulation, and excessive free fatty acids provide substrate for hepatic TG synthesis.[21]

On the contrary, study by Usoro, CAO. et al., (2006). IGWEH, JC. et al., (2005), Kanwar, G. et al., (2014), were not compatible to the present study. All of their study explored that, there was no significant change on TG level in postmenopausal women.[14-15,18]

According to our study revealed clear evidence that, statistically significant difference of fasting TG level in different age groups of postmenopausal women in Rajshahi city. Present study showed that fasting TG level were increasing with age of postmenopausal women and it was statistically significant (P-value=0.029).

The present study revealed clear evidence that, 11% of postmenopausal women had significant increase in fasting LDL-C level and 9.5% of postmenopausal women had significant increase in fasting total cholesterol level in Rajshahi city. This was in agreement with the findings detected by the following studies-Chaoji, SA. et al., (2015) detected that, high LDL-C level among (32%) and high total cholesterol level among (25%) of postmenopausal women.[6] KS Premkumar, DR. et al., (2017) detected high LDL-C level among (19.6%) and high total cholesterol level among (7.8%) of postmenopausal women.[8]

Bhagya, V. et al., (2011), Sapkota, AS. et al., (2015), Bade, G. et al., (2014), Das, J. et al., (2013), Pardhe, BD. et al., (2017), Shenoy, R. et al., (2015), Ifueko, OD. et al., (2013), Usoro, CAO. et al., (2006), Kulkarni, MD. et

al., (2014), similar to the present study, all of their study results showed, there were statistically significant increase in LDL-C and total cholesterol level in postmenopausal women.[11,16,12,13,20,21,22,14,19]

According to Shenoy, R. et al., (2015), lipoprotein lipase (LPL) is regulated by circulating estrogen. LPL catalyzes the hydrolysis of VLDL to form intermediate-density lipoprotein and later LDL.[21] Estrogen deficiency after menopause increases the plasma LPL and hepatic TG lipase activity causing plasma LDL to accumulate and also leads to down-regulation of LDL receptors.

On the contrary, study by Igweh, JC. et al., (2005), Kanwar, G. et al., (2014), Mohammad, FM. et al., (2017) were not compatible to the present study. Their study results explored that, there were higher LDL-C level but no statistically significant change in total cholesterol level in postmenopausal women.[15,18,17]

The present study revealed clear evidence that, fasting serum LDL-C level and fasting serum total cholesterol level does not differ significantly among different age groups of postmenopausal women in Rajshahi city.

CONCLUSION

Frequency of increased TG level (80%), increased LDL-C level (11%), increased total cholesterol level (9.5%), low HDL-C level (95.5%) in postmenopausal women. TG level were increasing with age of postmenopausal women and it was statistically significant. LDL-C, total cholesterol, HDL-C level does not differ significantly among different age groups of postmenopausal women. There was mixed type of hyperlipidemia was present in postmenopausal women.

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