e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2026; 18(3); 1067-1069

Original Research Article

A comparative Study of Serum Lipid Profile and Body Mass Index in Premenopausal, Perimenopausal and Postmenopausal Female Patients Attending IPD/OPD at District Hospital, North Goa

Sumentha D'Souza[1], Sandip Sardessai[2]

[1]JR in Physiology, Department of Physiology, Goa Medical College, Panaji, Goa, India
[2]Professor & Head, Department of Physiology, Goa Medical College, Panaji, Goa, India

Received: 17-01-2026 / Revised: 19-02-2026 / Accepted: 22-03-2026
Corresponding Author: Dr. Sandip Sardessai
Conflict of interest: Nil

Abstract:

Background: Menopause is associated with decreased estrogen levels, leading to alterations in lipid metabolism and increased cardiovascular risk.

Methods: A cross-sectional study was conducted among women attending IPD/OPD, categorized into premenopausal, perimenopausal, and postmenopausal groups. BMI was calculated, and fasting lipid profile (TC, TG, LDL, HDL) was analyzed and compared statistically.

Results: Postmenopausal women exhibited significantly higher TC, TG, LDL, and BMI, along with lower HDL compared to other groups ($p < 0.05$). Perimenopausal women showed intermediate values, indicating progressive worsening of lipid profile and BMI with menopausal transition.

Keywords: Menopause, Lipid profile, Body Mass Index.

DOI: 10.25258/ijcpr.18.3.169

Introduction

A women from her intrauterine life till the end experiences different stages of reproductive life under the influence of female hormones which is a physiological process[1]. The sex hormones which are secreted in minute quantities not only play an important role in woman's reproductive life but also influence metabolism in a significant way[1]. Specially Estrogen plays an important role in lipid metabolism[1]. In perimenopause there are two stages to the perimenopause or menopausal transition: The early transition where cycles are primarily regular with relatively few interruptions and the late transition, where amenorrhea becomes more prolonged and lasts for 60 days upto FMP[2]. Premenopausal women have fewer complaints than perimenopausal and postmenopausal women[2]. Menopause is a permanent cessation of menstruation due to loss of ovarian function at the end of reproductive life[3]. Previous studies reveal that hormonal changes associated with menopause alter serum lipid levels, which may play a role an important role in cardiac related disorders associated with menopause[3]. In young women, where oestrogen production is high, serum lipids are normal but after menopause, lipid levels are increased resulting in increased incidence of coronary artery diseases[3]. This shows the possible relationship among oestrogen, normal lipid profile and athereosclerosis and the relative immunity to coronary artery diseases [3]. The body mass index has a major influence on blood pressure and lipid profile and as such is a good predictor of hypertension and hyperlipidemia[4]. The gradual change from reproductive to non-reproductive phase of life results in adverse changes in glucose and insulin metabolism, body fat distribution, fibrinolysis, vascular endothelial dysfunction and also causes derangement of lipoprotein profile[3]. This study may be useful for early diagnosis and primary prevention from cardiovascular disease in premenopausal; perimenopausal and postmenopausal females[3].

Materials and Method

The subjects attending IPD/OPD at district hospital, North Goa were taken for the study. After taking informed consent from the subjects, a detailed history of each will be taken and thorough general examination will be conducted. Then the subjects will be divided into three groups:

Premenopausal (20 to 40 years)

Perimenopausal (40 to 45 years)

Postmenopausal (45 to 65 years

Study Design: cross sectional comparative study.

Study Setting: Study will be conducted in district hospital Mapusa, Goa, India.

Sample Size: calculated using G*POWER 3.1.9.7.

Effect size of 0.25.

80% power and 95% confidence.

Required sample size is 108.

Sampling Method: simple random sampling.

Methodology: after taking IEC approval, consent will be taken from healthy women.

For the estimation of lipid profile,5ml venous blood sample will be collected after 12hr overnight fasting from each subject and lipid profile will be estimated by semi-automated analyser using enzymatic method. lipids that will be analysed are: Triglycerdes, HDL, LDL, VLDL, serum total cholesterol.

Data collection: anthropometric measurements:

Height: will be measured in centimeters using stadiometer.

Weight: will be measured using weighing scale.

Body mass index: calculated as weight/ height (kg/m2).

Inclusion Criteria: female patients in the age group of 20-40years as premenopausal ,40 -45years as perimenopausal and 45-65years as postmenopausal and who are willing to give consent will be enrolled

Exclusion Criteria: Patients having endocrine disorders and having malignancy will be excluded from the study

Premenopausal women with pre-existing abnormal lipid profile and smokers and alcoholics will be excluded from the study

Results

Table 1: Comparison of Lipid Profile and BMI Among Premenopausal, Perimenopausal, and Postmenopausal Women

Parameter	Premenopausal (mean ± SD)	Perimenopausal (mean ± SD)	Postmenopausal (mean ± SD)
Total Cholesterol (mg/dl)	183.86 ± 44.38	191.78 ± 41.47	189.77 ± 45.90
LDL (mg/dl)	113.96 ± 38.06	119.06 ± 75.89	120.01 ± 86.92
VLDL (mg/dl)	21.585 ± 15.045	22.9 ± 16.11	24.28 ± 13.48
HDL (mg/dl)	49.27 ± 13.38	49.27 ± 14.32	45.10 ± 11.03
Triglycerides (mg/dl)	107.92 ± 47.91	114.43 ± 50.4	120.04 ± 53.77
VLDL/HDL ratio	0.54	0.46	0.56
BMI (Kg/m²)	22.16 ± 5.28	24.7 ± 3.38	25.85 ± 4.56

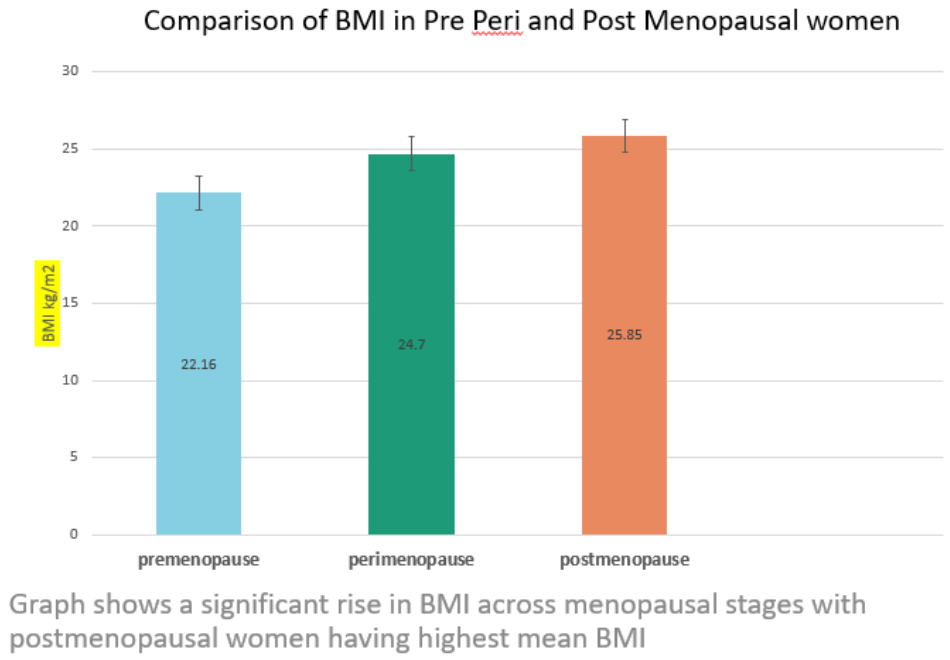

Figure 1: Comparison of BMI in Pre Peri and Post Menopausal women

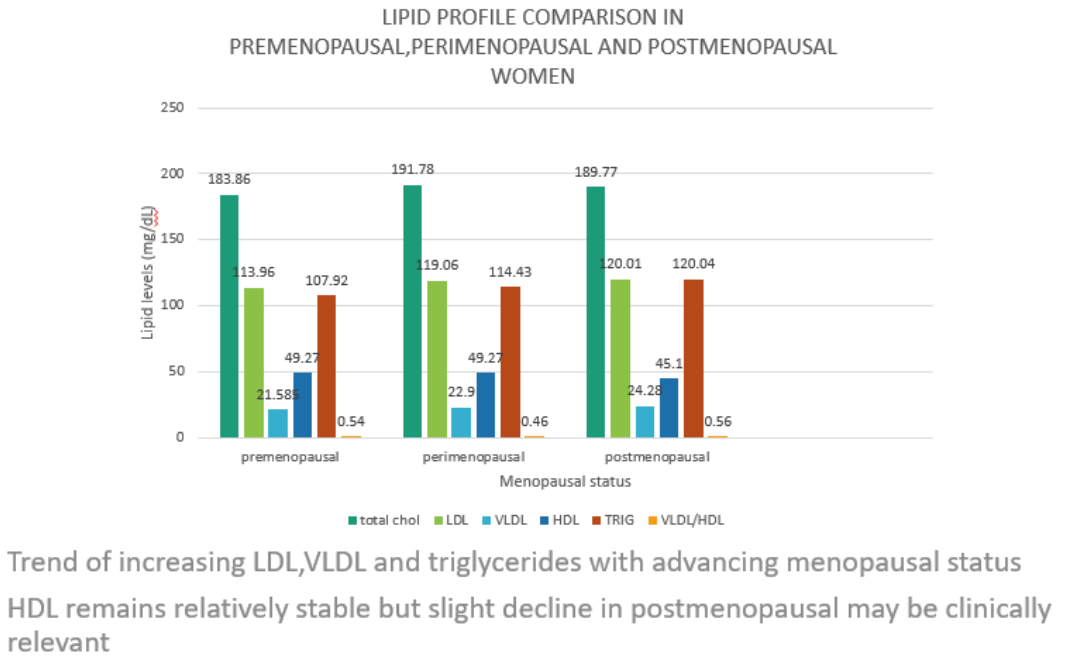

Figure 2: Lipid profile comparison in premenopausal, perimenopausal and postmenopausal women

Discussion

BMI significantly higher in peri and postmenopausal women LDL and VLDL elevated, HDL showed a near significant decline Estrogen deficiency explains increase in BMI and lipid changes Similar results Carr MC 2003, Jensen MD 2018 Indian studies khadikar SS et al 2013 Conflicting results: HDL not reduced (Janssen et al 2016).

Some studies showed no BMI change (Lovejoy et al 2008).

Differences may reflect lifestyle, ethnicity or sample size.

Conclusion

the study demonstrated a significant rise in BMI from premenopausal to postmenopausal stages with postmenopausal women showing the highest values. Among lipid parameters, LDL and VLDL were significantly elevated reflecting adverse alterations in lipid metabolism during menopause. These findings highlight that menopausal transition is associated with increased BMI and atherogenic lipid changes predisposing women to higher cardiovascular risk.

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