

Original research article**A cross-sectional study of dyslipidemia in post-menopausal women****¹Dr. Shyamala G, ²Dr. Manjunath M, ³Dr. Sankalp**¹Professor, Department of General Medicine, VIMS and MCH, Ballari, Karnataka, India^{2,3}Post-Graduate, Department of General Medicine, VIMS and MCH, Ballari, Karnataka, India**Corresponding Author:**

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Abstract

Introduction: Dyslipidemia is highly prevalent among women. Women undergo a number of hormonal changes throughout their lives that have significant effects on lipoprotein metabolism. With menopause, women experience a worsening of their lipid profile with transition to higher and more atherogenic dyslipidemia.

Objectives: The present study aims to determine the prevalence of dyslipidemia in postmenopausal women and the factors associated with it.

Methodology: The present study was conducted on the patients attending the outpatient and inpatient department of General Medicine, VIMS and also patients referred from other departments of VIMS combined group of hospitals of MCH, Ballari. Patients fulfilling the inclusion criteria's were enrolled in the study. A pre-tested, semi-structure questionnaire was used for data collection and statistical analysis was done to obtain the results.

Conclusion: This study concludes that majority of the women in this study had deranged lipid profiles in the form of high LDL levels and low HDL levels and had vascular complications without any other risk factor or any systemic diseases previously. Hence screening for dyslipidemia in postmenopausal women is recommended.

Keywords: Dyslipidemia, post-menopause, lipid profile

Introduction

The imbalance of lipids, such as triglycerides, low-density lipoprotein (LDL), and high-density lipoprotein (HDL), is known as dyslipidemia ^[1]. In women, dyslipidemia is very common. Throughout their lives, women experience a variety of hormonal shifts that have a big impact on how their bodies process lipoproteins. Women who are going through menopause experience their lipid profile getting worse as it transitions to higher and more atherogenic dyslipidemia ^[2]. Cardiovascular disease (CVD), which continues to be the major cause of morbidity and mortality in women worldwide, is known to be influenced by dyslipidemia. Over the course of a woman's lifespan, the likelihood of having dyslipidemia rises, with adverse changes occurring around menopause. Estrogen levels fluctuate during menopause and the years preceding the last menstrual cycle, leading to eventual estrogen insufficiency, which has been linked to proatherogenic changes in the lipid profile.

Menopausal status is linked to increases in serum total cholesterol, LDL cholesterol, apolipoproteins, and triglycerides as well as a decrease in HDL cholesterol (HDL-C), independent of ageing. Additionally, recent studies indicate that functional HDL cardioprotective qualities are lost after menopause. Menopausal hormone therapy (MHT) is not recommended for primary or secondary CVD prevention because even though early MHT initiation has favorable effects on lipid profiles, it does not translate into improved CVD outcomes ^[3].

Women with conditions more linked to CVD during menopause, such as polycystic ovarian syndrome, premature menopause, early menopause, premature ovarian insufficiency and familial hypercholesterolemia, should get special consideration. Hence this study was undertaken to find out the prevalence of dyslipidemia in postmenopausal women and the factors associated with it.

Methodology

The present cross-sectional study was conducted on the patients attending the inpatient and outpatient department of General Medicine, VIMS and also patients referred from other departments of VIMS combined group of hospitals of MCH, Ballari. 114 patients fulfilling the inclusion criteria's were enrolled in the study. A written informed consent was obtained from each patient in their own language. A pre-tested, semi-structure questionnaire was used for data collection. Physical examination and the required investigations (LDL, HDL, TG, VLDL etc.) were carried out. Association between the

qualitative variables was seen by using Chi square/Fischer’s exact test. Descriptive statistics of each variable was presented in terms of mean, standard deviation, and standard error of mean. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant.

Results

In the present study, majority of the patients in the study population were between 61-70 years of age group with a mean age of 62.52±11.56 years (Fig.1). 31 (27.19%) patients were overweight (BMI 25-30kg/m²) and 3(2.6%) were obese (BMI>30kg/m²) (Fig.2). Of the 114 subjects, 33(28.95%) had high levels of total cholesterol (>200mg/dl) (Fig.3), 78(68.42%) had low HDL levels (<50mg/dl) and less than 1% had high HDL (>60mg/dl) levels (Fig.4). 64 (56.14%) patients were observed to have high LDL levels (>100mg/dl) (Fig.5) and 42(36.84%) had high levels of VLDL (>34mg.dl) (Fig.6). 27 (23.68%) study participants had high triglyceride levels (200- 499mg/dl) (Fig.7). 22 (19.30%) subjects had vascular complications (Fig.8). Vascular complications included-stroke (59.09%), acute coronary syndrome (27.27%) and peripheral vascular disease (13.64%) (Fig.9). Out of the 22 subjects who had vascular complications, 7 individuals (31.82%) had elevated total cholesterol levels (Table 1), 13 (59.09%) had low HDL levels (Table 2), 16 (72.73%) had high LDL levels (Table 3), 7 (31.82%) had high VLDL levels (Table 4), and 3 (13.64%) had high triglyceride levels (Table 5). Only 1 (4%) patient having vascular complication was overweight (Table 6).

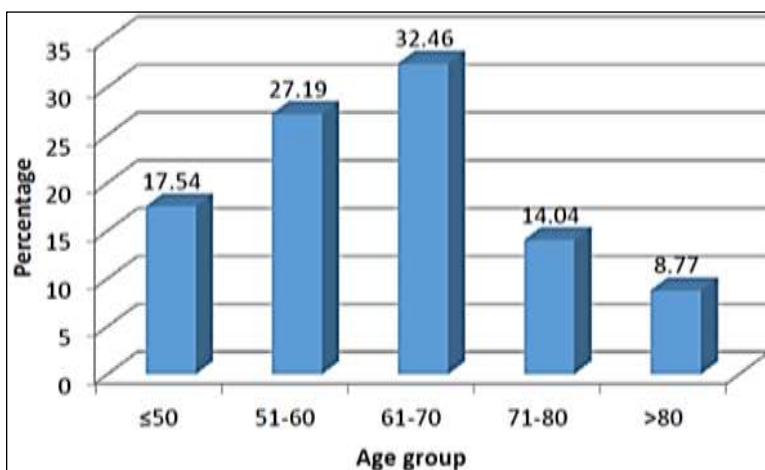


Fig 1: Distribution of study population according to Age

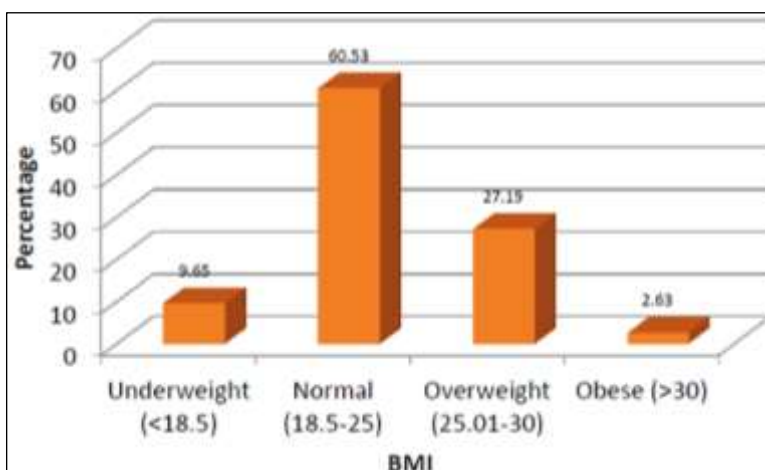


Fig 2: Distribution of study population according to BMI

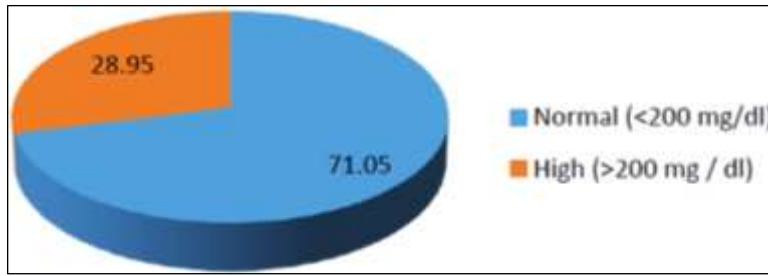


Fig 3: Distribution of Cholesterol level in study population

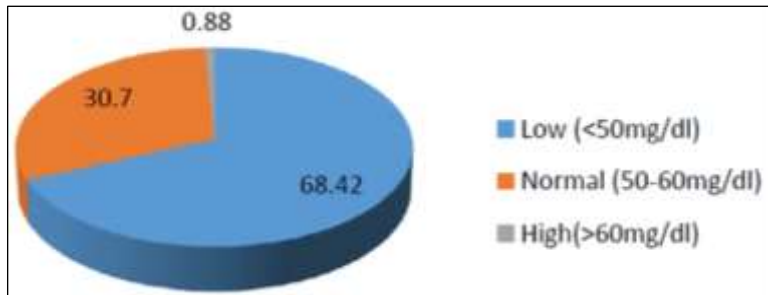


Fig 4: Distribution of HDL level in study population

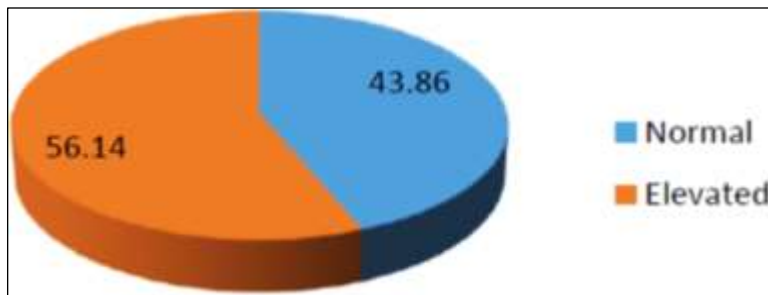


Fig 5: Distribution of LDL level in study population

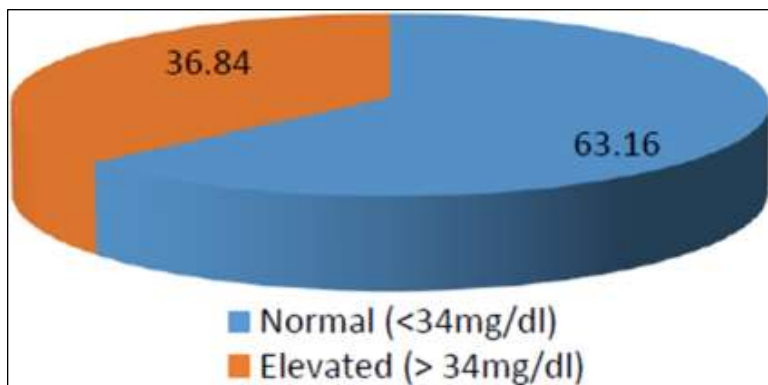


Fig 6: Distribution of VLDL level in study population

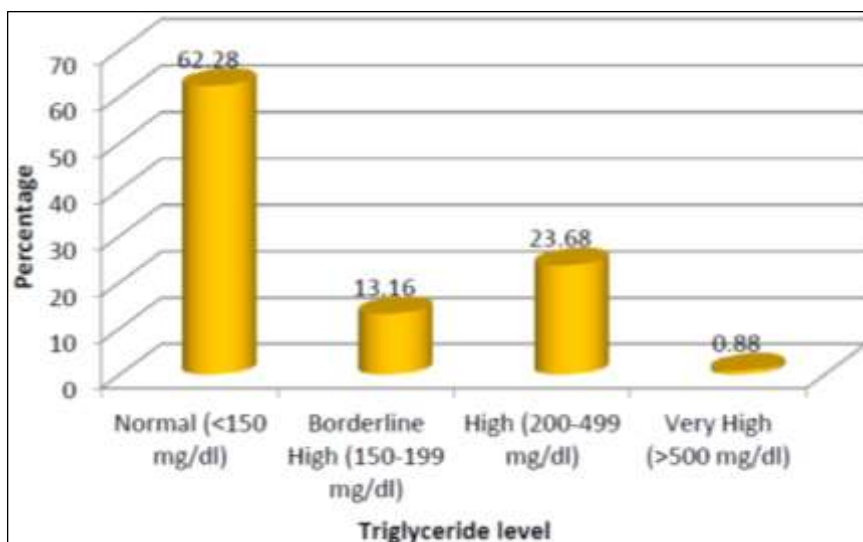


Fig 7: Distribution of Triglyceride level in study population

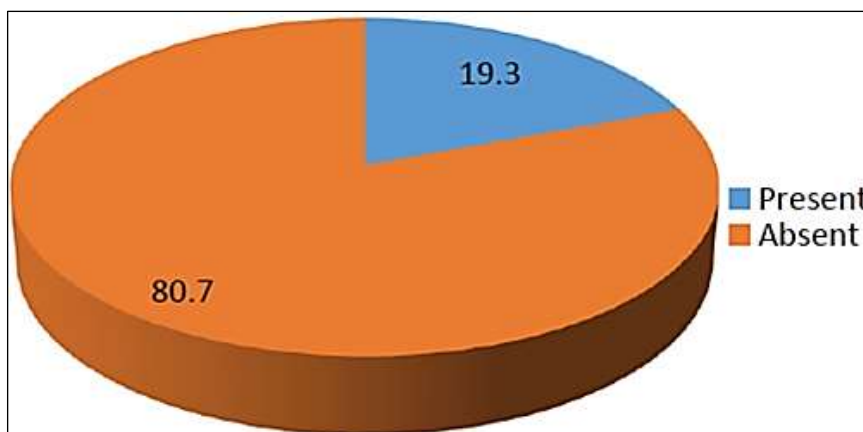


Fig 8: Frequency of Vascular Complication in study population

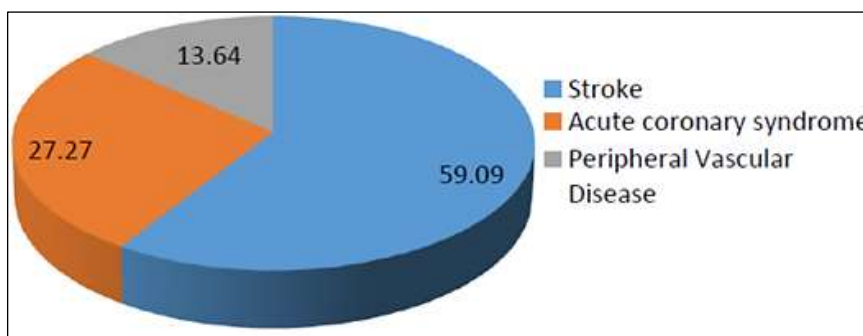


Fig 9: Types of vascular complication among study population

Table 1: Total Cholesterol value in patients with vascular complications

Total Cholesterol	Number of Subject	Percentage
Normal (<200 mg/dl)	15	68.18
High (>200 mg/dl)	7	31.82
Total	22	100.00

Table 2: Distribution of HDL cholesterol in patients with vascular complications

HDL-C	Number of subject	Percentage
Normal (40-60 mg/dl)	9	40.91
Low (<40 mg/dl)	13	59.09
High (>60 mg/dl)	0	0.00
Total	22	100.00

Table 3: Distribution of LDL cholesterol in patients with vascular complications

LDL-C	Number of subjects	Percentage
Normal (<100 mg/dl)	6	27.27
High (>100 mg/dl)	16	72.73
Total	22	100.00

Table 4: Distribution of VLDL cholesterol in patients with vascular complications

VLDL	Number of subject	Percentage
Normal (<34 mg/dl)	15	68.18
High (>34 mg/dl)	7	31.82
Total	22	100.00

Table 5: Distribution of Triglyceride level in patients with vascular complications

Triglyceride level	Number of Subjects	Percentage
Normal (<150 mg/dl)	14	63.64
Borderline High (150-199 mg/dl)	5	22.73
High (200-499 mg/dl)	3	13.64
Very High (>500 mg/dl)	0	0.00
Total	22	100.00

Table 6: Distribution of BMI in patients with vascular complications

BMI (kg/m2)	Number of subject	Percentage
Underweight (<18.5)	5	22.73
Normal (18.5-25)	16	72.73
Overweight (25.01-30)	1	4.55
Obese (>30)	0	0.00
Total	22	100.00

Discussion

The incidence of cardiovascular diseases (CVD) increases after menopause and may be due to changes in the plasma lipid-lipoprotein levels that occur following menopausal transition. Physiological estrogen withdrawal during menopause plays a major role in abnormal lipid metabolism. In the current study, out of 114 postmenopausal women, majority of them were in the age group of 61-70 years. This is in accordance with the study conducted by Maullik S *et al.* [4]

In the current study, the following observations were made:

Among 114 postmenopausal women:

- Total cholesterol was high among 33 patients. Mean total cholesterol level was 189.64±25.7 mg/dl.
- HDL was low among 78 women. Mean HDL level was 41.23±10.18 mg/dl.
- LDL was elevated among 64 patients. Mean level of LDL Cholesterol was 106.10 ±24.83mg/dl. Classified as Type IIa and IIb dyslipidemia.
- VLDL was high in 36.84% of study population with mean VLDL of 33.42±10.41mg/dl. Classified as Type IIb, IV, and V dyslipidemia.
- 23.68% of study participants had high triglyceride levels.

Studies conducted by Reddy Kilim S *et al.* [5], Tiwari J *et al.* [6], Bashu Dev Pardhe *et al.* [7], Maullik S *et al.* Usoro CAO *et al.* [8] and Igweh JC *et al.* [9] observed elevated levels of total cholesterol, LDL, VLDL, triglycerides and decreased HDL which is similar to the observations made in our study.

Among pre-menopausal women, risk of cardiovascular disorders is comparatively less than their male counterparts. However, this benefit is abolished after 60 years of age after menopause, as there is loss of ovarian functions and depletion of various ovarian hormones. This results in adverse changes in glucose and insulin metabolism, body fat distribution, coagulation, fibrinolysis and vascular endothelial dysfunction. Hence, it is necessary to screen for lipid profile among postmenopausal women which would help in preventing further complications.

Conclusion

This study concludes that majority of the women after menopause have deranged lipid profiles in the form of high cholesterol, LDL, VLDL, triglycerides levels and low HDL levels. Hence, they are at a greater risk of vascular complications without any other risk factor or any systemic diseases previously. Hence screening for dyslipidemia in postmenopausal women is recommended. Dyslipidemia can be diagnosed early and specific treatment with lifestyle modifications can bring a lot of improvement in cardiovascular health and in turn reduce the risk of mortality and morbidity among postmenopausal

women.

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