

Study of good and bad cholesterol in Surgical and natural menopause

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Abstract

Aims and Objectives: 1. To compare HDL (Good Cholesterol) and LDL (Bad Cholesterol) in women with Surgical and Natural menopause. 2. To make aware the women in Surgical and Natural menopause about the risk of coronary heart disease due to Hyperlipidemia. **Material and Method:** 50 women with surgical menopause between 45 – 50 years of age. Fasting serum samples of all women with surgical and natural menopause were analyzed for lipid profile on autoanalyser Olympus AU 400 in central lab of Biochemistry department. **Summary of the Results:** In this study Patients with surgical menopause had significantly lower serum HDL levels ($p < 0.01$) and significantly increased serum LDL levels ($p < 0.01$) when compared to those with natural menopause. **Conclusion:** Women in surgical menopause have higher levels of LDL and lower levels of HDL which reflects that they are at a higher risk of developing coronary heart disease as compared to women with natural menopause.

Keywords: Surgical menopause, Natural menopause, LDL, HDL, Cardiovascular diseases.

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Received Date: 23/06/2015 Revised Date: 03/07/2015 Accepted Date: 05/07/2015

Access this article online	
Quick Response Code:	Website: www.statperson.com
	DOI: 06 July 2015

INTRODUCTION

The term menopause is defined as the permanent cessation of menstruation resulting from the loss of ovarian follicular activity. Natural menopause is recognized to have occurred after 12 consecutive months of amenorrhea, for which there is no other obvious pathological or physiological cause.¹ *Surgical menopause* is the cessation of menses resulting from surgical removal of the uterus, leaving one or both ovaries, or the removal of both ovaries.² Lipid profile abnormalities in the menopausal women are common health hazard all over the world. There is derangement of lipid profile because of hormonal changes during this period.³ Epidemiological

studies confirmed relationships between menopause and CVD, with highest CVD risk among surgical menopausal women.⁴⁻⁷

MATERIAL AND METHODS

Cases – fifty women aging between 44 to 50 years who have undergone Hysterectomy with bilateral oophorectomy in past one to two years. Control – fifty women aging between 44 to 50 years who are experiencing natural menopause since past one to two years. Informed consent was taken from all the participants included in the study. Institutional Ethical committee permission was taken. 5 ml blood sample was collected by venipuncture in plain tube. Fasting serum samples of all women with surgical and natural menopause were analysed for LDL and HDL on autoanalyser Olympus AU 400 in central lab of Biochemistry department. Autopure HDL-C and LDL-C reagent kit were used for direct quantitative determination of HDL and LDL respectively. An independent (unpaired) sample t-test was used to compare the difference of means for independent quantitative variables following normal distribution. In this analysis, variables showing p-value less than 0.05 were considered to be statistically significant and less than 0.01 as very

significant. Pearson chi-square test was used to test significance of qualitative variables like symptoms. The SPSS software was used for data analysis.

RESULTS

1] Serum High Density Lipoprotein: In this study the mean level of HDL in study group was found to be 34.3 ± 2.68 while that in control group was 49.64 ± 4.37 . On applying independent (Unpaired) sample t – test, the difference in mean HDL level between both the groups was found to be significant with p value < 0.01 .

Table 1: Mean serum HDL Level of surgical and natural menopausal females

Menopause	N	Mean HDL level in mg%	Standard Deviation (mg%)	Standard Error (mg%)
Surgical	50	34.3	2.628	0.372
Natural	50	49.64	4.374	0.619

Mean Difference= -15.34 mg%

Independent Sample t test:- t value -21.26, df-80.3, p value < 0.01

2] Serum Low Density Lipoprotein: In this study the mean level of LDL in study group was found to be 161.58 ± 9.26 while that in control group was 145.3 ± 9.93 . On applying independent (Unpaired) sample t – test, the difference in mean LDL level between both the groups was found to be significant with p value < 0.001 .

Table 2: Mean serum LDL Level of surgical and natural menopausal females

Menopause	N	Mean LDL [mg%]	Standard Deviation [mg%]	Standard Error [mg%]
Surgical	50	161.58	9.26	1.31
Natural	50	145.3	9.93	1.40

Independent Sample t test:- t value -8.48, df-98, p value < 0.001

CONCLUSIONS

Surgical menopausal women were at higher risk of cardiovascular disease than Natural menopausal women.

DISCUSSION

Gradual decrease of serum estradiol levels especially after the age of 45 years may be responsible for some features of metabolic syndrome such as abdominal obesity, insulin resistance, dyslipidemia and hypertension.⁸ It has been suggested that, estradiol deficiency after menopause causes insulin resistance which in turn causes increased circulatory level of TG in both natural and surgical menopause.⁹ Estradiol stimulates Apo-A1 synthesis in liver and small intestine resulting in an increase in HDL-C level.¹⁰ Also estradiol increases the number of LDL receptors in the liver and therefore increases the uptake of

LDL-C from blood into liver.¹¹ Thus estradiol increases HDL and decreases LDL in serum. Therefore estradiol deficiency in menopausal women may lead to increase serum LDL-C and decrease HDL-C level. Serum estradiol level decreases abruptly in surgical menopausal women.¹² This acute withdrawal of the hormone in surgical menopausal women may cause more changes in lipid profile level than those of natural menopausal women.¹³ In the present study Surgical menopausal women carried low risk while natural menopausal women carried no risk of cardiovascular heart disease according to guidelines of Framingham Heart study.¹⁴ A stronger relationship was found between cardiovascular disease morbidity, mortality and surgical menopausal women.¹⁵ It is well known fact that hypercholesterolemia is a key factor in the development of atherosclerosis.¹⁶ A number of changes that occur in the lipid profile after menopause are associated with increased risk of atherosclerosis, coronary heart disease and myocardial infarction and this may be due to lack of estradiol.¹⁷ Therefore ovarian estradiol levels seems to be inversely related to the development of cardiovascular disease.¹⁸

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2. Lipid profile and Menopausal symptoms were also compared among surgical and natural menopausal women.
3. Fifty women with surgical menopause and fifty women with natural menopause ; since 1 - 2 years were enrolled in the present study.
4. Hormonal analysis was done by Solid Phase Competitive Chemiluminescent Enzyme Immunoassay on fully automated Immulite 1000 analyzer.
5. Statistical analysis was performed by applying independent (unpaired) sample t-test to compare the difference of means for independent quantitative variables like hormones and lipid parameters while Pearson chi-square test was used to test significance of qualitative variables like symptoms.
6. In the present study ; levels of LH and FSH were significantly increased while the levels of Estradiol , Progesterone and Testosterone were significantly decreased in Surgical menopause as compared to natural menopause.
7. On comparison of lipid profile of Surgical menopausal women with Natural menopausal women ; only decrease in HDL and increase in LDL and Total Cholesterol:HDL ratio were significant findings among both menopausal groups.
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Source of Support: None Declared
Conflict of Interest: None Declared