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CORRELATION OF SERUM CHOLESTEROL AND BONE MINERAL DENSITY IN POST MENOPAUSAL WOMEN

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ABSTRACT

Background- To find a correlation between serum cholesterol and Bone mineral density in post menopausal women

Methods- The study was carried on matched cases and controls. Biochemical analysis of serum cholesterol was done in both cases and controls.

Results- Analysis of the data shows that by the univariate logistic regression the value serum total cholesterol was significantly associated with osteoporosis. BMI values were not statistically significantly associated with osteoporosis.

Conclusion- On the decrease in bone mineral density and osteoporosis in postmenopausal women influence many risk factors.

KEYWORDS : Osteoporosis, Menopause, Lipid Profile, BMI.

INTRODUCTION

Osteoporosis is defined as a progressive, systemic, skeletal disease characterized by low bone mass and microarchitectural deterioration of bone tissues with a consequent increase in bone fragility and susceptibility to fracture. In postmenopausal women, osteoporotic fractures are more common than stroke, myocardial infarction, and breast cancer combined. Fractures can be costly and result in disability or death. Because there are no signs or symptoms of osteoporosis other than fracture, risk assessment is necessary to identify those at higher risk for clinical events.[1]

Bone mineral density (BMD), a golden criterion recommended by the WHO, is the primary diagnostic index for osteopenia and osteoporosis. Early postmenopausal women with an atherogenic lipid profile had lower lumbar and femoral BMD and had an increased risk of osteopenia compared to those with a normal lipid profile, suggesting that hyperlipidemia could be associated with osteoporosis.[2].

MATERIAL AND METHODS

Inclusion criteria-
All postmenopausal women (1-5 years after the last menstrual cycle) with BMI 18.5-25 who are willing to participate in the study.

Exclusion criteria -
Diabetes, chronic renal disease, inflammatory arthritis, diseases of thyroid and para thyroid glands, liver disease, malignancy, GIT disease like Crohn's disease and malabsorption, Use of drugs like statins, corticosteroid, hormone replacement therapy, diuretics, drugs for osteoporosis, Secondary osteoporosis due to endocrine diseases.

Study group I consisted of 50 postmenopausal females who had been diagnosed with osteoporosis in the Cabinet for Osteodensitometry by determining bone mineral density by DEXA method at the lumbar spine (L2-L4).

Group II consisted of 50 females in the postmenopausal age which after determination of bone mineral density by DEXA method, has not been diagnosed with osteoporosis.

RESULTS

Table 1. BMI

BMI(Kg/Mt^2)	Group-I	Group-II
Mean	22.13	21.19
SD	1.78	2.05
P-value	>0.05	

The mean BMI in women with osteoporosis was 22.13±1.78 and in Group-II was 21.19±2.05. The results were statistically insignificant

Table 2. Total cholesterol

Total Cholesterol(mg/dl)	Group-I	Group-II
Mean	201.13	183.21
SD	34.12	54.36
P-vale	0.01	

Analyzing the average values of serum cholesterol in our study,we found that the mean cholesterol level in group-I was 201.13 ±34.12 mg/dl and 183.21 ±54.36 mg/dl in group-II. The mean cholesterol level was significantly higher in women with osteoporosis.

DISCUSSION

The mean BMI in women with osteoporosis was 22.13±1.78 and in Group-II was 21.19±2.05. The results were statistically insignificant

Sadat-Ali M et al (2005)[3]observed that the mean BMI in group A with women of >6 children was 31.95 kg/m2 and in group B with women of <5 children was 29.14 kg/m2. The BMD of the lumbar spine of group A was 0.850 g/cm^2 (SD±0.112) compared to group B in which it is 0.699 g/cm^2 (SD±0.141), p<0.005. This difference was statistically significant.

Skrzek A et al (2014)[4]suggested the optimal values of the body mass index (BMI) which would indicate the most favourable preservation of the bone mineral density in postmenopausal women is 26.9 kg/m^2.

Shukla J et al (2013)[5] found that postmenopausal women with osteoporosis had significantly increased values of total cholesterol (Mean 137.11 mg/dl SD 7.28). This is in accordance with the result in the above study. Adami and colleagues[6] found no significant association of elevated serum cholesterol with a decrease in bone mineral density at the hip level in women aged 68-75 years. Y.-Y. Chen et al[11] found that postmenopausal women with osteoporosis had a significantly higher total cholesterol level compared to those with the normal bone mineral density. Li et al [7] worked on relationship between lipid profiles and bone mineral density and observed no correlation between total cholesterol level and osteoporosis susceptibility in postmenopausal women. M.K. et al[8] observed that BMD at femur (0.887±0.152) decreased significantly with increasing quartiles of total cholesterol (<200mg/dl) (P = 0.024) in highest quartile in postmenopausal women.

CONCLUSION

After analysing the results of the study, it can be concluded that serum cholesterol is associated with bone mineral density in postmenopausal women. Hence a lipid profile is recommended in postmenopausal women as an atherogenic lipid profile is a risk factor for the development of osteoporosis in the elderly postmenopausal females. Thus, preventive measures can be instituted in the form of lifestyle modifications, diet and drugs to improve the quality of life in this group of females.

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