

Original Research Article

Evaluation Of Bone Loss In Perimenopausal Diabetic Versus Non Diabetic Women in an Outreach Camp

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Abstract:

Introduction:

Osteoporosis and Diabetes Mellitus are major and growing public health problems particularly among perimenopausal women..[2] This study was conducted to correlate prevalence of osteopenia and osteoporosis in perimenopausal women especially in those with diabetes.

Materials and methods:

In an outreach camp organised by Department of Obstetrics and Gynaecology, Government Medical College Patiala, the study was performed on 65 perimenopausal women above the age of 45 years, out of which 17 were known cases of Diabetes. Age, BMI, BMD and RBS were measured and compared in Diabetic with Non Diabetic group. Chi square test was applied on the data and used for obtaining the results.

Results:

Mean SD ages were 65.29 ± 10.49 v/s 57.72 ± 12.63 in Diabetic v/s Non Diabetic groups . Weight was 67 ± 12.41 vs 68.8 ± 12.38 in Diabetic and Non Diabetic groups respectively. Mean BMI in Diabetic group was 28.09 ± 4.29 and in Non Diabetic group it was 27.70 ± 4.29 . There was a significant difference in bone marrow density between the diabetic and non diabetic group. Mean BMD in Diabetic group was -2.33 ± 0.94 and that in Non Diabetic group it was -1.52 ± 0.54 .

Conclusion:

Osteopenia and osteoporosis both are common in perimenopausal women with osteoporosis being more common in diabetics.

Keywords:

Osteoporosis, Diabetes mellitus, Perimenopause, Osteopenia.

Introduction:

Menopause brings changes in all aspects of life of a woman be it social, hormonal, physical and mental. Similar is the importance of perimenopause.^[1,2] Menopause typically occurs between 45 to 55 years of age, mean age being 46.2 years for Indian women. Chronic conditions like osteoporosis hypertension, heart disease and diabetes are more common during and after this age.^[8] Osteopenia and Osteoporosis is characterized by decrease in bone mineral density and bone matrix. It is very important in peri and post menopausal women because of increased risk of fractures.^[2] Osteopenia

which is followed by osteoporosis is a serious problem and can extensively affect the psychosocial functions of individuals. As defined by WHO, BMD > -1 is normal, BMD between -1 to -2.5 is considered osteopenia and < -2.5 is osteoporosis.^[1] Oestrogen blocks the absorption power of osteoclasts, increases the trans intestine transportation of calcium, increases absorption of Calcium from Kidneys. But during and after Menopause due to declining levels of oestrogen, activity of osteoclasts increases which leads to destruction of bone mass.^[9] Studies have shown that there is a high risk of fracture in osteoporotic women with hyperglycemia.^[9]

Materials And Methods

An outreach camp for perimenopausal women was organised by Department of Obstetrics and Gynaecology, Government Medical College Patiala in April 2019. A total of 65 perimenopausal women were taken over the age of 45 years. This was a cross sectional study. Out of 65 women 17 were

Diabetic and rest Non-Diabetic. A complete set of data was collected for each woman: Age, Height, Weight, BMI, BMD, RBS, History and duration of Diabetes and Menopause were included. Data was analysed by chi-square test. Statistical significance was set at a p value of <0.001.

Result

Table – 1 : Mean Age and BMI of Women

Variables	Mean	S.D.
Age	59.73	12.48
Height	156.60	6.54
Weight	68.36	12.22
BMI	27.82	4.23

Table – 2 : Mean Age, BMI, BMD of Diabetic Versus Non-Diabetic Women

Variables	DM		Non-DM	
	Mean	BMD	Mean	S.D.
Age	65.29	10.49	57.72	12.63
Height	155.59	5.92	156.90	6.83
Weight	67.00	12.41	68.80	12.38
BMI	28.09	4.29	27.70	4.29
BMD	-2.33	0.94	-1.52	0.54

Table – 3 Mean incidence of Osteopenia and Osteoporosis in Diabetic / Non Diabetic Women

Variables	DM		Non-DM	
	Number	Percentage	Number	Percentage
Normal > -1	0	0	3	4.62
Osteopenia -1 to 2.5	9	13.84	45	69.2
Osteopenia <- 2.5	8	12.31	0	0
Total	17	26.15	48	73.85
Chi Square	24.496			
P value	<0.001			
Significance	HS			

Discussion

In our study mean age of population was 59.73 ± 12.48 years. Mean age in Diabetic group was 65.29 ± 10.49 and in non diabetic it was 57.72 ± 12.63 . In a meta-analysis, Bagheri et al evaluated all the Persian studies about osteoporosis in postmenopausal women and reported their average

age as 55.8 ± 8.2 . In another study Baiat et al conducted on 200 postmenopausal women with osteoporosis had mean age of 50 ± 5.7 years. Shoumer et al conducted a study on prevalence of low bone mass in postmenopausal Kuwaiti women residents in the largest province of Kuwait. Their mean age was 55 ± 0.3 years. The Mean age in our study was more as compared to others.[3,6,10] The mean weight of the

Non-Diabetic and Diabetic women was 68.8 ± 12.38 and 67 ± 12.41 kg respectively in our study. The mean weight of the osteoporotic women in a study by Mohammadzadeh et al, was reported to be 69.1 ± 9.7 Kg. Yamamoto Met al studied the correlation between the serum Pentosidine levels with the presence of vertebral fractures in postmenopausal women with type 2 diabetes with mean weight of 56.5 ± 11.4 . The mean weight of the women was also reported to be 67.16 ± 8.10 in a study by Mahdavi Roshan et al. Our Mean weight was comparable with other studies.^[4,5,7]

Body mass index was lower in the Non Diabetic group (27.7 ± 4.29 kg/ metre square) compared to the diabetic group (28.09 ± 29 kg/ metre sq). BMI was 27.8 ± 4.1 , 29 ± 4 , and 27.3 ± 2.8 kg/ msq in Mohammadzadeh et al, Ebrahim et al and Mehdiroshan et al study, respectively. BMI was 26.3 ± 4.8 in a study by Raffaele A et al on identifying older diabetic women at risk of poor diabetic control. BMI in Diabetic perimenopausal women is more than the healthy perimenopausal cases as we have seen in this study.^[4,5]

There is a significant difference between the bone marrow density in the diabetic group

(-2.33 ± 0.94) than nondiabetic group (-1.52 ± 0.54). Out of total 65 women 17 were Diabetic ie. 26.15 % and 73.85% nondiabetic. In the Diabetic group ie 26.15%, 12.31% had osteoporosis and rest osteopenia that is almost half of the diabetic population. None in the Diabetic group had normal bone marrow density. Out of 73.85%, non-diabetic group, only 4.62% women had normal bone marrow density while 69.2% women had bone marrow density which fell in the range of osteopenia. No women was found to be osteoporotic in the non diabetic group. In a study by Mohammadzadeh et al the prevalence of osteopenia and osteoporosis was 47.7 percent and 55.3 percent among women respectively. In a study by Baiat et al 53% of women had osteopenia and 26.5% had osteoporosis. In the study of Bahrami et al, the incidence of osteoporosis in the diabetic group was significantly more than the other.^[4,6] In our study total osteopenia detected was 83.04%, osteoporosis 12.31% and no bone loss in 4.62%.

Our study had sample size less than 100 and was conducted in educated upper middle socioeconomic group. Also, above findings were incidental findings.

Table 4 for BMI

Study	Mean BMI
Mohammadzadeh et al	27.8 ± 4.1
Ebrahim et al	29 ± 4
Mehdiroshan et al	27.3 ± 2.8
Raffaele et al	26.3 ± 4.8
Our study	27.82 ± 4.23

BMI in our study was comparable with other studies.

Table 5 for Percentage of Bone Loss

Study	Percent of Osteopenia	Percent of Osteoporosis
Mohammadzadeh et al	47.7	55.3
Baiat et al	53	26.5
Our Study	83.04	12.31

Conclusion

The prevalence of osteopenia and osteoporosis is higher in perimenopausal women. In Diabetic women approaching and after Menopause the bone loss is even more than the normal healthy perimenopausal women. The results of our study demonstrate the role of menopause and diabetes both as bone mass reducing factors. Menopause being a natural phenomenon, proper control of diabetes can be an effective way in prevention of osteoporosis in women at risk.

Conflict of Interest : None

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