

ORIGINAL RESEARCH

Analysis of Frequency of Osteoporosis in Post Menopausal Diabetic Women at a Tertiary Care Centre

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ABSTRACT

Background: Patients with diabetes, along with macro- and microvascular complications, may experience various musculoskeletal disorders such as osteoporosis, osteopenia, diabetic foot syndrome, and Charcot's arthropathy. The present study was conducted to assess frequency of osteoporosis in post menopausal diabetic women. **Materials & Methods:** The present descriptive cross-sectional study was carried out over a period of 6 months to assess the frequency of Osteoporosis in Post menopausal diabetic women. A semistructured questionnaire was used to find out the sociodemographic background of the patients. The BMD score was determined. Statistical analysis was carried out by using the statistical package for social sciences version 22.0 for Windows (SPSS Inc, Chicago, Illinois, USA). **Results:** Out of 80 participants, most of the participants were below 60 years of age group (56.25%), and 30% belonged to the 61-70 year age group. The Majority (61.25%) of participant's age of onset of menopause was 46- 50 years. Osteoporosis of at least one site was present among 81.25% of participants. Osteoporosis of the lumbar spine and femoral neck were present among 71.25% and 53.75% of respondents, respectively. The Majority of participants had Osteoporosis. **Conclusion:** The present study showed that majority of participants had osteoporosis of at least one site therefore, it can be concluded that postmenopausal women are susceptible to Osteoporosis.

Keywords: Postmenopausal Women, Osteoporosis, Diabetic.

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INTRODUCTION

Osteoporosis is the most common metabolic disorder, which is accompanied by a decrease in bone mass and destruction of bone tissue.¹ Osteoporosis is characterized by a simultaneous decrease in bone mineral density and bone matrix. As a result, the bone mass decreases but its composition remains intact.² It is not symptomatic until there is a pathologic fracture. Thus, the true occurrence of osteoporosis may be significantly underestimated because many women who suffer minimal trauma fractures still are not being evaluated for osteoporosis.^{3,4} Diabetes is connected to Osteoporosis by alterations in metabolic and endocrine physiology, which are primarily associated with substantial comorbidities. According to reports, Osteoporosis (OP), also known as diabetic Osteoporosis, affects more than half of type 1 diabetes

patients (DO). On the other hand, several cross-sectional investigations in type 2 diabetes have reported normal⁵ or elevated⁶ bone mass, which is surprising given the increased fracture risk associated with the disease.⁷ Several studies have attributed the increased risk of fracture in T2DM patients to various factors including diabetes duration, diabetic complications, inadequate glycemic control, insulin use, and increased risk of falls.^{8,9} Diabetes has negative effects on bones over the long term. Diminished bone remodeling in T2DM patients tends to lead to lower bone quality. Chronic hyperglycemia causes an accumulation of advanced glycation end products (AGEs) which can reduce bone strength.¹⁰ The present study was conducted to assess frequency of osteoporosis in post menopausal diabetic women.

MATERIALS & METHODS

The present descriptive cross-sectional study was carried out over a period of 6 months to assess the frequency of Osteoporosis in Post menopausal diabetic women in Department of Medicine, Varun Arjun Medical College & Rohilkhand Hospital, Shahjahanpur, Uttar Pradesh, India. Before the commencement of the study ethical clearance was taken from the Ethical Committee of the institute and informed consent was taken from the participants after explaining the study to them. A detailed history was taken from the patients. Post menopausal women who had diabetes more than one year were included in the study. Women who have asthma, glucocorticoid consumption, cardiac disease, and chronic gastric problems (malabsorption, chronic diarrhoea, and Crohn's disease) were excluded from the study. Patients also have nondiabetic-related renal trouble, ovariectomy, rheumatoid arthritis, or other rheumatic-inflammatory disorders were excluded from the study. A semistructured questionnaire was used to find out the sociodemographic background of the patients. The BMD score was determined.

Operational definitions:

Osteoporosis: Based on the T score from BMD, if T-Score ≤ 2.5 : Positive for osteoporosis and T-Score ≥ 2.5 : Negative for osteoporosis

Diabetes Mellitus: Defined as diabetes as ADA criteria

A fasting plasma glucose (FPG) level of 126 mg/dL (7.0 mmol/L) or higher, or

A 2-hour plasma glucose level of 200 mg/dL (11.1 mmol/L) or higher during a 75-g oral glucose tolerance test (OGTT), or

Random plasma glucose of 200 mg/dL (11.1 mmol/L) or higher in a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, or

A hemoglobin A1c (HbA1c) level of 6.5% (48 mmol/mol) or higher.

Menopause and Postmenopause: Menopause is diagnosed when a woman has gone without a period for 12 consecutive months. Post menopause is the years after menopause.

RESULTS

Out of 80 participants, most of the participants were below 60 years of age group (56.25%), and 30% belonged to the 61-70 year age group. The Majority (61.25%) of participant's age of onset of menopause was 46- 50 years.

Osteoporosis of at least one site was present among 81.25% of participants. Osteoporosis of the lumbar spine and femoral neck were present among 71.25% and 53.75% of respondents, respectively. The Majority of participants had Osteoporosis.

Table 1: Demographic characteristics of study population

| Variable | N(%) |
|----------------------------------|------------|
| Age group | |
| ≤60 | 45(56.25%) |
| 61-70 | 24(30%) |
| >70 | 11(13.75%) |
| Age of onset of menopause | |
| ≤46 | 26(32.5%) |
| 46-50 | 49(61.25%) |
| >50 | 5(6.25%) |

Table 2: Distribution of respondents according to presence of osteoporosis

| Characteristics | N(%) |
|--|------------|
| Osteoporosis: lumbar spine | |
| Present | 57(71.25%) |
| Absent | 23(28.75%) |
| Osteoporosis: femoral neck | |
| Present | 43(53.75%) |
| Absent | 37(46.25%) |
| Osteoporosis: at least one site | |
| Present | 65(81.25%) |
| Absent | 15(18.75%) |

DISCUSSION

There is substantial evidence that osteoporosis and related fractures is a clinically significant and commonly underestimated problem in patients with T2DM.^{11,12}

Out of 80 participants, most of the participants were below 60 years of age group (56.25%), and 30%

belonged to the 61-70 year age group. The Majority (61.25%) of participant's age of onset of menopause was 46- 50 years. Osteoporosis of at least one site was present among 81.25% of participants. Osteoporosis of the lumbar spine and femoral neck were present among 71.25% and 53.75% of respondents,

respectively. The Majority of participants had Osteoporosis.

Karimifar M et al concluded in the study that Osteopenia and osteoporosis is more common in diabetic postmenopausal women compare to the non-diabetic postmenopausal women.¹³

Raška I, et al found that In T2DM patients the prevalence of osteoporosis was 25% and low trauma vertebral (Vfx) and non-vertebral fractures were found in 8% and 19% women, respectively. When compared between subjects with and without fractures, there were no significant differences in BMD at any site between the groups, except for distal radius, which was significantly lower in T2DM women with Vfx ($p < 0.05$ vs. non-fractured without osteoporosis). We found no associations between bone and glucose metabolism variables, sRAGE and BMD. No significant differences were observed in sRAGE levels according to their rs1800625, rs 2070600 genotype or fracture prevalence. Serum osteocalcin was significantly lower in T2DM women ($p < 0.01$ vs. controls) and in T2DM women with Vfx ($p < 0.05$) vs. non-fractured without osteoporosis. T2DM women with low daily walking activity (< 2 h daily) had significantly higher serum sclerostin levels ($p < 0.05$ vs. those who were walking > 2 h daily).¹⁴

Gomes LC, et al concluded that postmenopausal women are susceptible to Osteoporosis.¹⁵

The study of Moghimi N, et al shows that type 2 diabetic patients have significantly lower T score values and more frequency of osteoporosis than healthy postmenopausal women.¹⁶

CONCLUSION

The present study showed that majority of participants had osteoporosis of at least one site therefore, it can be concluded that postmenopausal women are susceptible to Osteoporosis.

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