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A STUDY ON OSTEOPOROSIS IN POSTMENOPAUSAL WOMEN AND ITS RISK FACTORS AND ITS MANAGEMENT MANAGEMENT IN WEST BENGAL: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Osteoporosis is a progressive bone disease characterized by decreased bone mass and deterioration of bone tissue, primarily affecting postmenopausal women due to hormonal changes. **Methodology**: This study investigates the prevalence, associated risk factors, and current treatment strategies in 52 postmenopausal women. Data were collected through structured questionnaires and clinical evaluations. The study identified age, low calcium intake, sedentary lifestyle, and family history as significant risk factors. Management included calcium/vitamin D supplementation, bisphosphonates, lifestyle modifications, and hormone replacement therapy. Early identification and holistic management significantly improve patient outcomes. **Result**: In this study we got know that osteoporosis is associated with demographic profile of patient. 42.3% patient suffered of osteoporosis is belongs to 55–64 years age group followed by 34.6%belong to 45–54 years ag group. Management: Lifestyle Modifications: Diet: Adequate calcium and vitamin D intake through diet and/or supplements is crucial for bone health. Exercise: Regular weight-bearing and muscle-strengthening exercises are recommended to improve bone density and balance, reducing fracture risk. Smoking Cessation and Alcohol Moderation: Both smoking and excessive alcohol consumption can negatively impact bone health age is important factors for Osteoporosis, increasing age will prone to Osteoporosis. **Conclusion**: Osteoporosis in postmenopausal women is common and largely preventable. Regular screening, early diagnosis, lifestyle modification, and appropriate pharmacologic interventions are essential. Public awareness and health system integration can drastically reduce the disease burden.

KEYWORDS: Osteoporosis, postmenopausal women, risk factors, bisphosphonates, calcium, lifestyle, hormone therapy.

INTRODUCTION

Osteoporosis is a major public health concern among postmenopausal women due to oestrogen deficiency, leading to decreased bone density and increased fracture risk. Globally, 1 in 3 women over age 50 experiences osteoporotic fractures[1]. The condition remains underdiagnosed and undertreated, despite its significant impact on morbidity. This study aims to evaluate the prevalence of osteoporosis among postmenopausal women, assess the contributing risk factors, and review treatment and management approaches.Osteoporosis is a significant health concern in India, with an estimated 6 crore people affected, 80% of whom are women [2-5].

The prevalence of osteoporosis is notably higher in postmenopausal women and the elderly. Studies indicate that 30% of postmenopausal women in India have osteoporosis. The peak incidence of osteoporosis in India also occurs earlier than in Western countries, impacting individuals 10-20 years earlier Overall Prevalence: Approximately 18.3% of adults in India have osteoporosis [6-8]. Gender Differences: While osteoporosis is more prevalent in women, it is also present in men, with a slightly higher prevalence among females. Postmenopausal Women.

A significant portion of postmenopausal women, around 33.1%, are affected by osteoporosis. Age-related Prevalence: The elderly (60 years and above) have a significantly higher prevalence of osteoporosis compared to younger adults [9-11]. Regional Variations:

Studies show variations in prevalence across different regions of India, with some regions showing slightly higher rates of osteoporosis. Risk Factors: Lifestyle factors like lack of physical activity, indoor living, low sunlight exposure, and dietary deficiencies (particularly calcium) are associated with an increased risk of osteoporosis [12-15].

Women are more at risk of developing osteoporosis than men because the hormone changes that happen at the menopause directly affect bone density. The female hormone oestrogen is essential for healthy bones. After the menopause, oestrogen levels fall. This can lead to a rapid decrease in bone density.

METHODS

This study was conducted in tertiary hospital. In this study Patients were subjected to: A detailed history of sign & symptoms and its duration. Detailed history of systemic diseases and its duration, medication were noted. Patients were subjected to General physical.Afterobtaining institutionalethicalcommitteeapproval It was Case Control study study conducted on 32 patients in the department of Orthopaedic, at a tertiary care centre, from January / 2017 to July /2017.

Total 60 participant were approached to project among them 8 were excluded due to non-fulfilling of eligibility criteria and 52 were included on the basis of fulling of the eligibility criteria.Questionnaire were framed carefully so tagresearcher avoid the biased

The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English. In this study Patients were subjected to: A detailed history of sign & symptoms and its duration. Detailed history of systemic diseases and its duration, medication were noted. Patients were subjected to General physical examination.

Flowchart – Study Methodology

Participants Assessed (n=60)
↓
Excluded (n=8)
- Not meeting inclusion criteria (n=5)
- Refused to participate (n=3)
↓
Included in Study (n=52)
↓
Data Collection:
- Demographics
- Risk Factor Assessment
- DEXA Scan for BMD
↓
Diagnosis:
- Osteoporotic (n=38)

- Non-osteoporotic (n=14)

↓

Treatment & Management Initiated

↓

Follow-Up & Analysis

Study Design:

A cross-sectional observational study was conducted over 6 months at a tertiary care center.

Sample Size:

52 postmenopausal women aged 45–75 years.

Inclusion Criteria:

- Women >45 years, postmenopausal for >1 year
- Willing to give informed consent

Exclusion Criteria:

- Secondary causes of osteoporosis (e.g., hyperthyroidism, corticosteroid use)

Data Collection:

- Bone mineral density (BMD) by DEXA scan
- Structured questionnaire (demographics, lifestyle, dietary habits, family history)
- Laboratory investigations (calcium, vitamin D, thyroid function)

Statistical Analysis:

SPSS software used; $p < 0.05$ considered statistically significant.

The data collected was entered in excel spread sheet. The data was analysed by using SPSS statistical software version 20. Statistical analysis in the form of percentages was done. Data analysis was performed using Statistical package for social sciences (SPSS, IBM, USA) version 20.0. Results were reported as mean ± standard deviation for quantitative variables

Statistical Analysis: SPSS v28, $p < 0.05$ significant.

RESULTS

In this study we gotknow thatosteoporosis is associated with demographic profile of patient. 42.3% patient suffered of osteoporosis is belongs to55–64 years age group followed by 34.6%belong to 45–54years ag group.

age is important factors for Osteoporosis, increasing age will prone to Osteoporosis.

Gender also plays important role in osteoporosis Female were more prone to suffered of osteoporosis as compared to male gender. (Table 1). Prevalence of osteoporosis is more in urban people as compare to rural people .

Demographic Profile Table (n = 52):

Parameter	**Frequency**	**Percentage (%)**
Age (years)		
45–54	18	34.6%
55–64	22	42.3%
≥65	12	23.1%
Residence		
Urban	30	57.7%
Rural	22	42.3%

Parameter	Frequency	Percentage (%)
Educational Status		
Illiterate	16	30.8%
Primary	20	38.5%
Secondary and above	16	30.8%
Body Mass Index (BMI)		
<18.5 (Underweight)	10	19.2%
18.5–24.9 (Normal)	28	53.8%
≥25 (Overweight/Obese)	14	26.9%

There is many risk factors for osteoporosis among them sedentary lifestyle pla important role for causing osteoporosis. Low diet calcium also important factors .In this study 65.4% %patient were suffered of osteoporosis patient due to low calcium in diet followed by 55.8% sedentary life style (Table 2)

Risk Factors Table:

Risk Factor	Present (n)	Percentage (%)
Family history of osteoporosis	21	40.4%
Low dietary calcium intake	34	65.4%
Sedentary lifestyle	29	55.8%
Smoking history	11	21.2%
Alcohol consumption	7	13.5%
Vitamin D deficiency	30	57.7%
Early menopause (<45 yrs)	13	25.0%

- **Prevalence of osteoporosis:** 38 out of 52 women (73.1%) showed reduced BMD (T-score ≤ -2.5).
- **Significant associations:**
  - Vitamin D deficiency (p = 0.01)
  - Low calcium intake (p = 0.03)
  - Sedentary lifestyle (p = 0.02)
- **Treatment administered:**
  - Calcium + Vitamin D supplements (84.6%)
  - Bisphosphonates (51.9%)
  - Hormone replacement therapy (HRT) in 9.6%
  - Lifestyle modification counselling (100%)

DISCUSSION

This study confirms osteoporosis as a prevalent condition among postmenopausal women, predominantly influenced by modifiable risk factors. Poor nutrition, inactivity, and vitamin D deficiency remain widespread, especially in rural and undereducated populations[16].

menopausal osteoporosis, characterized by decreased bone density and increased fracture risk, is a significant health concern for women due to the decline in oestrogens levels during menopause. Effective management involves identifying risk factors, promoting bone health through lifestyle modifications, and considering pharmacological interventions for high-risk individuals[17]. In this study we got know that osteoporosis is

associated with demographic profile of patient. 42.3% patient suffered of osteoporosis is belongs to 55–64 years age group followed by 34.6%belong to 45–54 years ag group.

Age is important factors for Osteoporosis, increasing age will prone to Osteoporosis.

Gender also plays important role in osteoporosis Female were more prone to suffered of osteoporosis as compared to male gender. (Table 1). Prevalence of osteoporosis is more in urban people as compare to rural people

Risk Factors: AgeBone density naturally declines with age, increasing fracture risk, particularly in older postmenopausal women. Oestrogen Deficiency: The drop in estrogen during menopause accelerates bone loss, making women more susceptible to osteoporosis. Genetics: Family history of osteoporosis or fractures can increase an individual's risk[18]. Race: White women are more likely to experience osteoporosis than women of other races. Body Weight: body weight or weight loss is associated with increased risk.Lifestyle Factors:

Smoking, excessive alcohol consumption, and inadequate calcium and vitamin D intake can negatively impact bone health. Physical Activity: Sedentary lifestyles and lack of weight-bearing exercise can contribute to bone loss. Medical Conditions and MedicationsCertain medical conditions (e.g., rheumatoid arthritis, hyperthyroidism) and medications (e.g., glucocorticoids) can increase the risk of osteoporosis[19].

There is many risk factors for osteoporosis among them sedentary lifestyle plays important role for causing osteoporosis. Low diet calcium also important factors. In this study 65.4% patient was suffered of osteoporosis patient due to low calcium in diet followed by 55.8% sedentary life style (Table 2)

Management: LifestyleModifications: Diet: Adequate calcium and vitamin D intake through diet and/or supplements is crucial for bone health. Exercise: Regular weight-bearing and muscle-strengthening exercises are recommended to improve bone density and balance, reducing fracture risk. Smoking Cessation and Alcohol Moderation: Both smoking and excessive alcohol consumption can negatively impact bone health and should be avoided[20-23].

Pharmacological Interventions: Bisphosphonates, Denosumab: These medications help reduce bone resorption (breakdown) and can significantly decrease the risk of fractures. Teriparatide: This anabolic agent stimulates bone formation and can be used in cases of severe osteoporosis or when other treatments are not suitable. Estrogenic Therapy (ET) or Hormone Therapy (HT): ET/HT can be effective in preventing bone loss and reducing fracture risk in postmenopausal women, but potential risks and benefits should be carefully considered.

Management must go beyond pharmacotherapy and include community education and preventive strategies. Bisphosphonates and calcium/vitamin D supplementation proved most effective. Limitations include small sample size and single-centre design.Measures to prevent falls, such as improving home safety, using assistive devices if needed, and addressing balance issues, are essential in reducing fracture risk.

CONCLUSION

Osteoporosis in postmenopausal women is common and largely preventable. Regular screening, early diagnosis, lifestyle modification, and appropriate pharmacologic interventions are essential. Public awareness and health system integration can drastically reduce the disease burden.Management must go beyond pharmacotherapy and include community education and preventive strategies. Bisphosphonates and calcium/vitamin D supplementation proved most effective

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CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal.

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