

# ORIGINAL ARTICLE

## Evaluation of level of osteoporosis in postmenopausal female

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### ABSTRACT:

**Background:** The term "porous bones" refers to the condition known as osteoporosis, which is defined by a reduction in bone mineral density. The present study was conducted to evaluate the level of osteoporosis in post-menopausal females.

**Materials & Methods:** 106 post-menopausal females of age ranging from 40-70 years were selected. Demographic, anthropometric and fracture data, and the risk factors for OP were collected. An assessment of blood calcium level was done. All subjects underwent BMD measurement using Achilles ultrasound bone densitometer. **Results:** Age group 40-50 years had 214, 50-60 years had 65 and 60-70 years had 27 subjects. The difference was significant ( $P < 0.05$ ). The duration of menopause was 1-5 years in 11, 6-10 years in 45 and  $>10$  years in 50 subjects. Osteoporosis was seen among 38 subjects. The fracture was seen in 12, 9 hip and 3 wrist. The difference was significant ( $P < 0.05$ ). The mean serum calcium level in osteoporosis subjects was 3.02  $\mu\text{g/ml}$  and in non-osteoporosis subjects was 7.58  $\mu\text{g/ml}$ . The difference was significant ( $P < 0.05$ ). **Conclusion:**

**Key words:** Bone mineral density, Osteoporosis, Postmenopausal women

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### INTRODUCTION

The term "porous bones" refers to the condition known as osteoporosis, which is defined by a reduction in bone mineral density.<sup>1</sup> It is regarded as a contemporary epidemic and is observed in the elderly population. Because osteoporosis weakens and fractures easily, even minor trauma increases the risk of bone breakage. These fractures may result in discomfort, disfigurement, and incapacity.<sup>2</sup> Roughly 10% of females are afflicted with this illness. Every year, reports of 247,000 hip fractures and over 500,000 vertebral fractures are made. Fractures are more common in women with osteoporosis. Osteoporosis and hip fracture demographic patterns are similar. The most dangerous consequence linked to osteoporosis is thought to be hip fracture. The yearly expense of healthcare for treating this issue ranges from seven to ten billion US dollars.<sup>3,4</sup> Skeletal growth, bone remodeling regulation, and skeleton maintenance are all dependent on hormonal, mechanical, and nutritional variables. The following categories include dietary, environmental, behavioral, genetic, reproductive status and history, illness states, medication therapy, and other additional factors that

contribute to the development of osteoporosis.<sup>5</sup> There are numerous approaches for objectively assessing bone mineral density (BMD). Dual-energy X-ray absorptiometry (DEXA), the most used technique, is regarded as the gold standard test since it is affordable, readily accessible, simple to use, and offers a reasonably accurate estimate of the BMD.<sup>6,7</sup> The present study was conducted to evaluate the level of osteoporosis in post-menopausal females.

### MATERIALS & METHODS

The present study consisted of 106 post-menopausal females of age ranging from 40-70 years. All enrolled subjects gave their written consent for participation in the study.

Data such as name, age etc. was recorded. Demographic, anthropometric and fracture data, and the risk factors for OP were collected. A thorough clinical examination was carried out. Assessment of blood calcium level was done. All subjects underwent BMD measurement using Achilles ultrasound bone densitometer. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

### RESULTS

**Table I Distribution of subjects**

Age group (Years)	Number	P value
40-50	14	0.05
50-60	65	
60-70	27	

Table I shows that age group 40-50 years had 214, 50-60 years had 65 and 60-70 years had 27 subjects. The difference was significant ( $P < 0.05$ ).

**Table II Assessment of parameters**

Parameters	Variables	Number	P value
Duration of menopause (Years)	1-5	11	0.04
	6-10	45	
	>10	50	
Osteoporosis	Yes	38	0.01
	No	68	
Type of fracture	Hip	9	0.02
	Wrist	3	

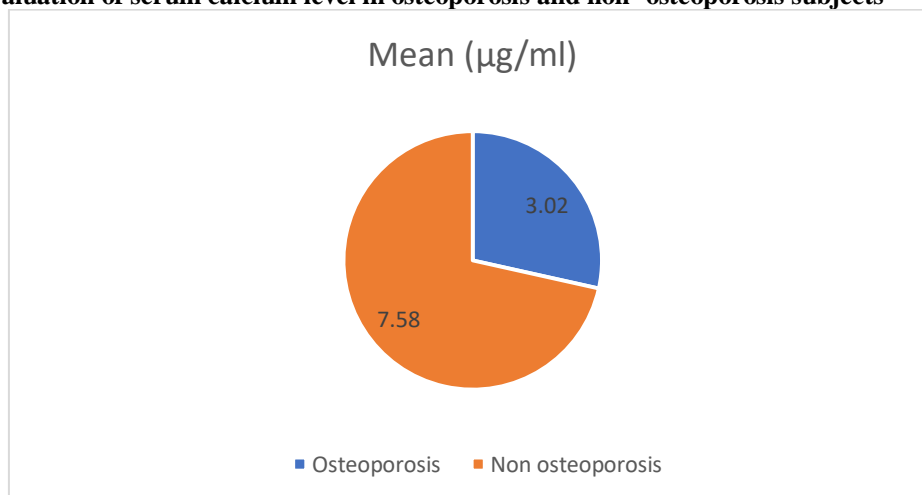
Table II shows that the duration of menopause was 1-5 years in 11, 6-10 years in 45 and >10 years in 50 subjects. Osteoporosis was seen among 38 subjects. Fracture was seen in 12, 9 hip and 3 wrist. The difference was significant (P< 0.05).

**Table III Evaluation of serum calcium level in osteoporosis and non- osteoporosis subjects**

Status	Mean (µg/ml)	P value
Osteoporosis	3.02	0.01
Non osteoporosis	7.58	

Table III, graph I shows that the mean serum calcium level in osteoporosis subjects was 3.02 µg/ml and in non-osteoporosis subjects was 7.58 µg/ml. The difference was significant (P< 0.05).

**Graph I Evaluation of serum calcium level in osteoporosis and non- osteoporosis subjects**



**DISCUSSION**

Micro-architectural degradation of bone tissue leading to bone fragility and low bone mineral density (BMD) are the hallmarks of osteoporosis, a multifactorial systemic skeletal disease.<sup>8</sup>When diagnosing osteoporosis, dual X-ray absorptiometry measurement of BMD is considered the gold standard. Osteoporosis is defined by the WHO as having a T-score of less than or equal to 2.5, while osteopenia is defined as having a T-score between 1.0 and 2.5.<sup>9</sup> The suggested anatomic region of focus is the lumbar spine and femoral neck. Because BMD declines with age, primary osteoporosis primarily affects women 10-15 years postmenopausal and senior men 75-80 years of age. The synthesis of estradiol decreases and follicle-stimulating hormone (FSH) levels rise with the start of menopause.<sup>10</sup>Women will endure several uncomfortable symptoms throughout the menopausal transition period, including dyspareunia, vaginal atrophy and dryness, hot flashes, night sweats, disturbed sleep, and mood swings.<sup>11,12</sup>The present

study was conducted to evaluate the level of osteoporosis in post-menopausal female.

We found that the age group 40-50 years had 214, 50-60 years had 65 and 60-70 years had 27 subjects. Aloia et al<sup>13</sup> in their study fifty-eight women with postmenopausal osteoporosis (crush fracture of the spine) were compared with 58 age-matched normal women. The osteoporotic women had lower total-body calcium levels and bone mineral content of the radius, had undergone an earlier menopause, smoked cigarettes more, and had breast-fed less often. They also had lower levels of estrone, estradiol, and testosterone and reduced levels of 25-hydroxyvitamin D, 24,25-dihydroxyvitamin D, and 1,25-dihydroxyvitamin D. These findings suggest the presence of changeable risk factors for the development of osteoporosis. Smoking should be discouraged. An adequate intake of calcium and vitamin D should be ensured. It is the opinion of the authors that those women who have had an early menopause or who have a low bone mass at the time of menopause should be given the choice of medically

supervised replacement therapy with estrogen and progesterone.

We found that the duration of menopause was 1-5 years in 11, 6-10 years in 45 and >10 years in 50 subjects. Osteoporosis was seen among 38 subjects. The fracture was seen in 12, 9 hip and 3 wrists. Rentero et al<sup>14</sup> recruited 4,960 women, at 96 primary care centers. The prevalence rates for the major osteoporosis risk factors in our population were: low calcium intake, 43%; benzodiazepine use, 35.1%, and height loss, 30.1%. Other relatively prevalent factors include: having suffered at least one fall during the preceding year; positive family history of falls (particularly on the mother's side), smoking, kyphosis, presence of any disease affecting bone metabolism, personal history of falls, and inability to rise from a chair without using one's arms. The least frequent factors were weight loss of greater than 10% over the preceding 10 years and problems in sensory perception that affect patient's ability to walk.

We found that the mean serum calcium level in osteoporosis subjects was 3.02 µg/ml and in non-osteoporosis subjects was 7.58 µg/ml. Cummings et al<sup>15</sup> found that 192 women had first hip fractures not due to motor vehicle accidents. In multivariable age-adjusted analyses, a maternal history of hip fracture doubled the risk of hip fracture and the increase in risk remained significant after adjustment for bone density. Women who had gained weight since the age of 25 had a lower risk. The risk was higher among women who had previous fractures of any type after the age of 50, were tall at the age of 25, rated their own health as fair or poor, had previous hyperthyroidism, had been treated with long-acting benzodiazepines or anticonvulsant drugs, ingested greater amounts of caffeine, or spent four hours a day or less on their feet. Examination findings associated with an increased risk included the inability to rise from a chair without using one's arms, poor depth perception, poor contrast sensitivity, and tachycardia at rest. Low calcaneal bone density was also an independent risk factor. The incidence of hip fracture ranged from 1.1 (95 percent confidence interval, 0.5 to 1.6) per 1,000 woman-years among women with no more than two risk factors and normal calcaneal bone density for their age to 27 (95 percent confidence interval, 20 to 34) per 1,000 woman-years among those with five or more risk factors and bone density in the lowest third for their age.

## CONCLUSION

Authors found that regular assessment of bone mineral density in post-menopausal women is mandatory as the level of osteoporosis in post-menopausal women was high.

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