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Prevalence of Osteoporosis in the Population of Coastal Andhra Pradesh in South India Assessed using Peripheral DEXA of the Ankle as a Screening Tool - A Cross-Sectional Study

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Abstract: ***Osteoporosis has become a very prevalent disease amongst the general population in India. Due to the higher incidence of vitamin D and calcium deficiency in the Indian population, there can be associated higher and earlier incidences of osteoporosis. Hence, we have done this cross-sectional study to discuss the age-wise and gender-wise distribution of osteoporosis in coastal Andhra Pradesh-South India that was obtained by screening done using peripheral DEXA. The prevalence of osteoporosis amongst women was 25% (36/144) and amongst men was 36% (13/36). Age-wise, most men with a low T score of <=-2.5 were between the age of 51-60 years, and most of the women who satisfied the osteoporosis criteria were between the age of 46-55 years.***

Keywords: Osteoporosis, Vitamin D, T score, Peripheral DEXA, Prevalence

1. Introduction

Osteoporosis has become a very prevalent disease amongst the general population in India. As per a study done in India, the prevalence of osteoporosis in postmenopausal women at the lumbar spine was 29%, the hip was 6% and the femoral neck was 29% [1]. This indicates how high the disease burden is. Osteoporosis causes a drop in the quality of life due to frequent bone pains and fractures due to trivial falls. Although most of the studies are centered around osteoporosis in postmenopausal women, due to the higher incidence of vitamin D and calcium deficiency in the Indian population, there can be associated higher and earlier incidences of osteoporosis. Hence, we have done this cross-sectional study to discuss the age-wise and gender-wise distribution of osteoporosis in coastal Andhra Pradesh-South India that was obtained by screening done using peripheral DEXA as we could not perform central DEXA due to financial and availability constraints and as peripheral DEXA can also be used as a significantly accurate screening tool [2].

2. Methods

From the hospital database, we shortlisted 191 people who underwent voluntary osteoporosis screening using a peripheral DEXA machine. Their demographic variables, T scores, and Z scores were collected using a pre-designed study proforma and have been represented accordingly.

3. Results

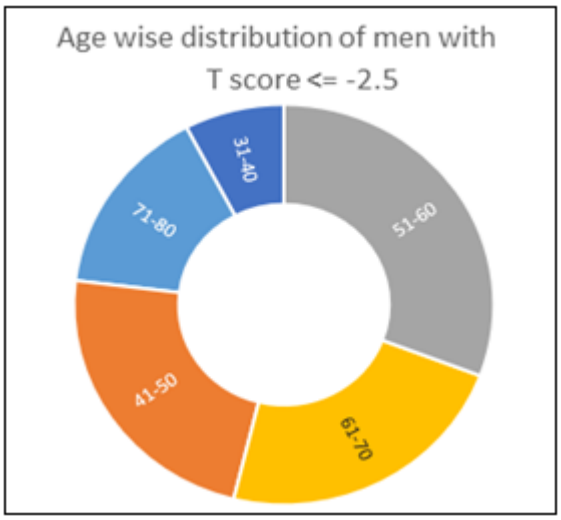
Out of the 191 subjects, 49 had a T score <=-2.5 on the report from a peripheral DEXA machine. Out of the 49 people, 36 were women and 13 were men. None of them reported any history of spontaneous fractures but 4 of them have bone pains with no probable cause other than osteoporosis. The overall prevalence of osteoporosis (as per their T score) in the population being studied was 25.65% (49/191). The prevalence of osteoporosis amongst women was 25% (36/144) and amongst men was 36% (13/36). This unusually high prevalence in men might be because of the number of men who got screened versus the number of women who got screened. Age-wise, most of the men who had a low T score of <=-2.5 were between the age of 51-60 years, and most of the women who satisfied the osteoporosis criteria were between the age of 46-55 years.

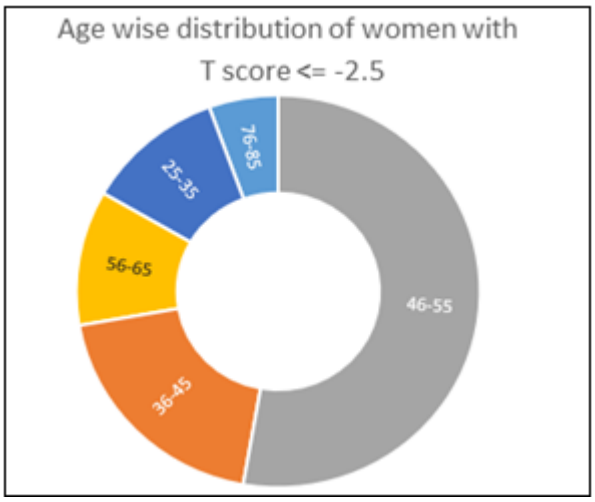
Table 1: Age-wise distribution of men with T score <=-2.5

Age (yrs)	Number of men with T score <=-2.5	% of total men with T score <=-2.5
31-40	1	7.68
41-50	3	23.08
51-60	4	30.78
61-70	3	23.08
71-80	2	15.38

Table 1: Age-wise distribution of women with T score <=-2.5

Age (yrs)	Number of women with T score <=-2.5	% Of total women with T score <=-2.5
26-35	4	11.11
36-45	7	19.44
46-55	19	52.78
56-65	4	11.11
66-75	0	0
76-85	2	5.56





4. Discussion

Osteoporosis is one of the most common metabolic bone disorders seen in the elderly, especially in post-menopausal women. This is mainly due to two causes-poor calcium and vitamin D intake and low estrogen levels. Estrogen plays a key role in maintaining bone mineral density [3, 5]. This is mainly by inhibition of the RANK ligand which is associated with the activation of osteoclasts and hence preventing bone resorption [5].

Testosterone has also been proven to have a significant impact on bone mineral density [6] but the main cause of elderly osteoporosis in men is due to lack of adequate minerals and lack of exercise. Exercise plays a key role in the prevention of osteoporosis. Numerous studies have proven that a postmenopausal daily exercise regimen can lead to significantly lower rates of osteoporosis [7].

Osteoporosis can be diagnosed by using a central DEXA scan which studies the bone mineral density. Apart from this, certain criteria can be used to diagnose osteoporosis from an x-ray but these methods have become obsolete after the availability of DEXA. Peripheral DEXA on the other hand-can be done easily as it just involves the ankle usually to give us an estimate of bone mineral density. It mainly assesses calcaneal bone mineral density and studies have shown that there is a significant correlation between the findings of peripheral DEXA and central DEXA [2, 4]. This is a very significant conclusion as central DEXA is expensive, the machine is bulky and not portable and it involves head-to-toe scanning. Hence, low-income countries such as India need to understand the role of peripheral DEXA in screening patients for osteoporosis.

Osteoporosis can lead to a lot of complications-especially spontaneous fractures or fractures due to trivial falls. Not only do these patients have problems with bone healing, but also the surgical outcomes might not be as fruitful as what they generally are in the general public. Hence, we must recognize osteoporosis early and manage it accordingly.

5. Conclusion

As observed, the overall prevalence of osteoporosis as detected by a peripheral DEXA is about 25% which correlates with the nationwide prevalence of osteoporosis as well. Although this might be a small population number, it does identify the need to address osteoporosis as an important health issue and counsel patients regarding the best way to proceed concerning the disease. Hence, it is the patient's and health care provider's responsibility to make sure that their nutritional intake is adequate and that they are exercising regularly which can help us fight against this disease.

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