



BASIC SCREENING TEST TO DETERMINE OSTEOPOROSIS AND OSTEOPENIA IN SUBURBAN POPULATION

Orthopaedics

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ABSTRACT

Background: The incidence of osteoporotic fractures increases with age and is approximately twice as high in women as in men at all ages. Bone fragility is a silent condition enhanced by low bone mass and microarchitecture deterioration of bone tissue which leads to osteoporosis. It increases bone fracture risk. Some study has shown there is increase prevalence of Osteoporosis for women and men also. The study was conducted by organizing screening camp of bone mineral density test was along Biochemical analysis was done such as serum calcium and Alkaline Phosphatase for all sample size at Dr VRK Medical College. **Methods:** In this study, 50 participants (Aged 25 years and above) evaluated for bone mineral density. Serum Calcium, Alkaline phosphatase Demographic details, food habit, weight was assessed in the prescribed format. By obtaining, BMD t- score, participants were termed as normal (T- score < - 1 SD), osteopenia (t- score – 1 to –2.5 SD) and osteoporosis (t- score < - 2.5 SD). **Results:** In this study the mean average age of study population group was 54 ± 14.21 years and out of 50 subjects enrolled for this study 26 subjects were males and 24 subjects were female. The mean BMD of 7 subjects was $T < -1$ SD, 30 patients were having $T -1$ to 2.5 SD (osteopenia), whereas 13 subjects were having $BMD < 2.5$ SD (osteoporosis). It was observed that with increasing age there were higher incidence of osteoporosis in patients with osteoporosis, 44 % were in the age group of 61 - 70yrs and 44 % were in the age group of 71 - 80 yrs. Compared to osteopenia group 18.1% were in the age group of 61- 70yrs and 23.4% were in the age group of 71 - 80 yrs. Chi square = 24.9, p value = 0.03. BMD was compared with gender it was seen that in patients with normal BMD, 28.6% were males and 71.4% were females, in patients with osteopenia 55.7% were males and 44.3% were females, in patients with osteoporosis 56% were males and 44% were females. there was no statistically significant association observed in gender and BMI $p > 0.05$ Chi square = 3.58, p value = 0.167. There was no statistically significant difference in the mean weight in patients with osteopenia compared to patients with osteoporosis. There was no statistically significant difference in the mean calcium when compared between normal BMD, osteopenia, and osteoporosis $p > 0.05$. There was significant difference in the mean ALP in between groups on multiple comparison ANOVA it was seen that mean ALP was significantly less in osteopenia compared to normal BMD and in osteoporosis compared to osteopenia. **Conclusion:** The prevalence of osteoporosis and osteopenia was increasing with the advancement in age. Increase in sedentary life style and lack of awareness of bone health.

KEYWORDS

Osteopenia, Osteoporosis, BMD, Alkaline Phosphatase, Serum Calcium

INTRODUCTION:

The incidence of osteoporotic fractures increases with age and is approximately twice as high in women as in men at all ages.⁽¹⁾ Bone fragility is a silent condition enhanced by low bone mass and microarchitecture deterioration of bone tissue which leads to osteoporosis. It increases bone fracture risk.⁽²⁻³⁾ Some study has shown there is increase prevalence of Osteoporosis for women and men also. The study was conducted by organizing screening camp of bone mineral density test was along Biochemical analysis was done such as serum calcium and Alkaline Phosphatase for all sample size at Dr VRK Medical College.

METHODS:

In this study, 50 participants (Aged 25 years and above) evaluated for bone mineral density. Serum Calcium, Alkaline phosphatase Demographic details, food habit, weight was assessed in the prescribed format. By obtaining, BMD t- score, participants were termed as normal (T- score < - 1 SD), osteopenia (t- score – 1 to –2.5 SD) and osteoporosis (t- score < - 2.5 SD).

RESULTS:

In this study the mean average age of study population group was 54 ± 14.21 years and out of 50 subjects enrolled for this study 26 subjects were males and 24 subjects were female. The mean BMD of 7 subjects was $T < -1$ SD, 30 patients were having $T -1$ to 2.5 SD (osteopenia), whereas 13 subjects were having $BMD < 2.5$ SD (osteoporosis).

	Mean (SD) No (%)
Age	53.20 (14.21)
Gender	
Males	26 (52%)
Females	24(48%)
BMD	
T < -1 SD	7 (14)
T -1 to 2.5 SD	30 (60)
< 2.5 SD	13 (26)
Age group	T < -1 SD T -1 to 2.5 SD < 2.5 SD
	No (%) No (%) No (%)

<= 30	0	1	0
31 - 40	3	7	1
41 - 50	1	4	0
51 - 60	2	5	2
61 - 70	1	6	5
71 - 80	0	7	5
Total	7 (100)	30 (100)	13 (100)

Comparison between age group and BMD

It was observed that with increasing age there were higher incidence of osteoporosis in patients with osteoporosis, 44 % were in the age group of 61 - 70yrs and 44 % were in the age group of 71 - 80 yrs. Compared to osteopenia group 18.1% were in the age group of 61- 70yrs and 23.4% were in the age group of 71 - 80 yrs. Chi square = 24.9, p value = 0.03

BMD was compared with gender it was seen that in patients with normal BMD, 28.6% were males and 71.4% were females, in patients with osteopenia 55.7% were males and 44.3% were females, in patients with osteoporosis 56% were males and 44% were females. there was no statistically significant association observed in gender and BMI $p > 0.05$ Chi square = 3.58, p value = 0.167

BMD	weight	p value
	Mean SD	
T -1 to 2.5 SD	63.64 7.60	0.861 (NS)
< 2.5 SD	63.96 7.90	

There was no statistically significant difference in the mean weight in patients with osteopenia compared to patients with osteoporosis.

There was no statistically significant difference in the mean calcium when compared between normal BMD, osteopenia, and osteoporosis $p > 0.05$.

	T < -1 SD	T -1 to 2.5 SD	< 2.5 SD	p value
	Mean SD	Mean SD	Mean SD	
Calcium	8.94 0.51	8.79 0.88	8.71 0.91	0.738
ALP	107.93 18.65	147.67 32.67	168.60 40.90	0.001

There was significant difference in the mean ALP in between groups on multiple comparison ANOVA it was seen that mean ALP was significantly less in osteopenia compared to normal BMD and in osteoporosis compared to osteopenia.

DISCUSSION:

Over past decade there is increased incidence and prevalence of cases with musculoskeletal disorders and it is hampering day to day activities which could be a leading to osteoporosis.

Unawareness of bone health is important factor and mass education should be done in this regard. The challenge of osteoporosis and osteopenia is huge and it has a great impact on morbidity and significant mortality risk increases due to complication associated with cofactors. From the output of the camp, the prevalence of osteoporosis and osteopenia was detected and reported. Out of all the cases the osteoporosis patients were more than osteopenia was were noted. This indicates the severity of the disease and should be evaluated for bone loss. Clinical osteoporosis occurs earlier in females due to lower estrogen levels In our study we found prevalence of osteoporosis in females were higher than in males, that means females have higher prevalence of osteoporosis than males but this difference was not statistically not significant^[4]

Similar result was found in study by Babhalkar S et al 2021.^[5] In our study it was noted that with increasing age there were higher incidence of osteoporosis in patients with osteoporosis, 44 % were in the age group of 61 - 70yrs and 44 % were in the age group of 71 - 80 yrs. Compared to osteopenia group 18.1% were in the age group of 61-70yrs and 23.4% were in the age group of 71 - 80 yrs. p value = 0.03. A higher prevalence of osteopenia suggests that these population having greater risk for developing osteoporosis in future. Hence, they should manage early to avoid further fractures^[6]

CONCLUSION:

The prevalence of osteoporosis and osteopenia was increasing with the advancement in age. Increase in sedentary life style and lack of awareness of bone health leading to osteoporosis in general population. This review focuses on need to early management of bone disorders for healthy human resource.

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