



Early Onset of Osteoporosis in North Indian Women

KEYWORDS

metacarpal radiogrammetry, combined cortical thickness, vernier caliper, women

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ABSTRACT

Background and Aim - According to WHO Technical Report Series released in 1990 Osteoporosis is a silent killer disease affecting mainly the aged population especially the western Europeans as well as Americans, frequently Indians and rarely blacks. Both men and women lose bone after 40 years. We aim to study on standardized hand x ray films, the cortical thickness of 2nd right hand metacarpal bone radiogram in north Indian females in youth. **Material and method**-Vernier callipers were used to measure cortical thickness, graphimetrically on standardised hand x-rays of 2nd right metacarpals to observe the cortical thickness in fifteen young women. **Result and Discussion** -This technique revealed statistically significant low values of the same indices in few young women of young age. But majority of them show a good peak bone mass. We have observed that women reach peak bone density till 33 years and we observed a drastic reduction in thickness of cortex values in few other females nearing 40s coinciding with hormone reduction in pre and peri menopausal years. Many studies abound in the same findings in different races. **Conclusion**-We conclude that in North Indian women have a fragile bone structure and as age advances it deteriorates further leading to possibility of fragility fractures such as hip fractures, colle's fracture in addition to vertebral collapse at a younger age than their female counterparts in other races residing in developed parts of the world especially Caucasians and Blacks. We have to start screening them at younger age like early thirties to identify latent bone deterioration in order to avoid consequences of osteoporosis.

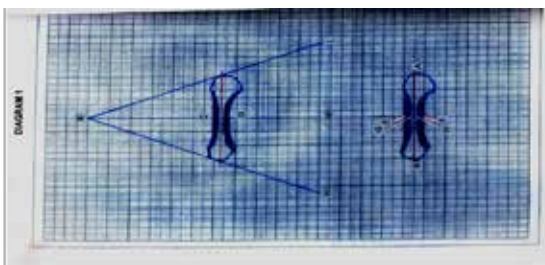
Introduction

Most people are familiar with osteoporosis in elderly but few know that it begins in youth. This precursor of osteoporosis is called as osteopenia and public has to be warned about it¹. It is also called as "young women's silent epidemic". In the west about 20 percent of young women suffer from it². Due to a simple fall as a result of osteoporosis a fracture can occur hence there is need for an early and cheap modality of diagnosis like an x ray.

Aim - To study bone mass density in the population including young women in late adulthood using a new technique on Right 2nd Metacarpal From Hand Radiographs.

Material and method

This study was done in the department of Radiology Dayanand Medical College And Hospital. Refer diagram 1 using a vernier caliper and hand X-rays the cortical thickness with other parameters were assessed in young females before 33 years using the technique of metacarpal radiogrammetry³. 15 subjects belonging to in and around Ludhiana district in Punjab were included in this study. The age group of less than 33 years and greater than 25 was included so as to estimate baseline bone mass in young north Indian females.



- LINE SEGMENT CD BISECTS THE 2ND METACARPAL AT MID SHAFT
- EF=SUBPERIOSTEAL DIAMETER AT MIDSHAFT (REFERS TO D)
- GH=ENDOSTEAL DIAMETER AT MIDSHAFT (REFERS TO d)

Diagram 1 -Method For Measurements Of Metacarpal On Radiographs

The midshaft of the 2nd metacarpal was determined and readings obtained to give combined cortical thickness 3

D-subperiosteal diameter measured in mm at midshaft of 2nd right metacarpal

d-endosteal diameter measured in mm at midshaft of 2nd right metacarpal

CCT(combined cortical thickness)= $D-d$ ⁴

Results

SERIAL NUMBER	AGE IN YEARS	MEAN		
		Subperiosteal diameter-D (mm)	Endosteal diameter-d (mm)	Combined-Cortical Thickness-CCT (mm)
F1	25	8.58	4.22	4.36
F2	26	7.54	0.82	6.72
F3	26	8.12	3.58	4.54
F4	26	7.54	2.10	5.44
F5	27	8.38	3.68	4.70
F6	27	8.08	3.20	4.88
F7	28	7.86	2.80	5.06
F8	28	7.86	1.88	5.98
F9	28	7.52	1.94	5.58
F10	29	8.90	3.48	5.42
F11	30	7.94	1.32	6.62
F12	30	6.84	2.26	4.58
F13	31	7.80	2.30	5.50
F14	32	7.46	3.18	4.28
F15	33	7.44	3.56	3.88

Table no 1. Subperiosteal, endosteal diameters and combined cortical thickness of 2nd metacarpal in females of young age

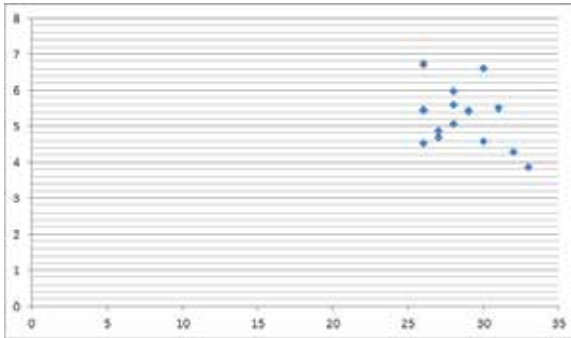


Figure no.1 The x gradient shows age in years and y gradient denotes combined cortical thickness in millimeter rule.

Result and Discussion

This study reveals ref to table no 1 that women are weak as compared to men and show early bone density decay beginning in younger days leading to increased risk of fragility fractures in advanced age. The mean value of CCT is 5.17mm with SD of 0.83mm .Range varies from lowest of 3.88mm to highest of 6.72mm. Most of them show a good bone density in younger years excepting a few .As shown in figure no 1 these few women with low values are as many as 30% by estimates from data. We never expected such low values to occur in healthy adults therefore this alarmed us to think in a new perspective that ⁵may be its an early osteoporosis called as osteopenia as the values are clearly below -1 SD from the mean in two of them. In another three there are borderline low values of CCT . This makes it 5 out of 15. lets find out what factors influence bone mass. It could be genetic link to Vitamin D receptor, age related, pre and peri menopausal, low BMI, sedentary lifestyle, hysterectomy with removal of ovaries, dieting, and lack of physical exercise combined with poor exposure to sunlight .

Conclusion

Identification of early cases of bone loss goes a long way to improve health in older years and prevent its sequelae. To begin with dietary supplements of calcium and Vitamin D can be given . She can be advised to undertake morning walk biweekly for one hour and take short breaks from desk jobs and move around briskly.

This work was undertaken by the author as a part of thesis in done in DMC and H, ludhiana

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