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THE FREQUENCY OF OSTEOPOROSIS AND OSTEOPENIA IN FEMALE POPULATION

KADIN POPÜLASYONDA OSTEOPOROZ VE OSTEOPENİ SIKLIĞI

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SUMMARY

Our aim was to evaluate the spinal and femoral bone mineral density (BMD) values of women who admitted to physical therapy and rehabilitation outpatient clinics by various complaints.

The age, weight and menopause status of the female were recorded. Those with a cause that may lead to secondary osteoporosis were not included in the study. The AP spine and femoral neck BMD values were measured in 1597 women by Lunar DPX 6956 (DEXA).

When patients were evaluated according to decades; for AP spine in 4th decade 55.3% were osteopenic, in 5th decade 39.2% were osteopenic and 5.5% were osteoporotic, in 6th decade 41.1% were osteopenic and 15.9% were osteoporotic, in 7th decade 41.4% were osteopenic and 37.4% were osteoporotic, in 8th decade 32.4% were osteopenic and 45.4% were osteoporotic; in 9th decade 27.3% were osteopenic and 45.5% were osteoporotic. Femur neck BMD T score values showed 36.8 % osteopenia in the 4th decade, 24.3 % osteopenia and 1.7 osteoporosis in the 5th decade, 34.7 % osteopenia and 2.5% osteoporosis in the 6th decade, 51.7 % osteopenia and 17.25% osteoporosis in the 7th decade, 54.9% osteopenia and 27.7% osteoporosis in the 8th decade, 45.5 % osteoporosis in the 9th decade. In our female subjects osteopenia was detected from at younger ages. So we are in the opinion that we have to inform women about the bone metabolism and osteoporosis from the youngbood.

Key Words: *Osteoporosis, frequency*

ÖZET

Amacımız Fizik Tedavi ve Rehabilitasyon kliniğine başvuran Türk kadınlarının lomber ve femur kemik mineral yoğunluğunu (KMY) değerlendirmekti. Kadınların yaş, kilo, menapoz durumu kaydedildi. Sekonder osteoporoza yol açacak nedenleri olanlar çalışmaya alınmadı.

Hastaları dekadlara göre değerlendirdiğimizde AP lomber vertebraya göre ; 4. dekatta %55.3'ü osteopenik, 5. dekatta %39.2 osteopenik ve %5.5 osteoporotik, 6.dekatta %41.1 osteopenik ve %15.9 osteoporotik, 7. dekatta %41.1 osteopenik ve %37.4 osteoporotik, 8. dekatta %32.4 osteopenik ve %45.4 osteoporotik, 9. dekatta %27.3 osteopenik ve %45.5 osteoporotikti.

Femur boyun KMY T skorlarına göre; 4. dekatta %36.8 osteopeni, 5. dekatta %24.3 osteopeni ve %1,7 osteoporoz, 6.dekatta %34,7 osteopeni ve %2,5 osteoporoz, 7. dekatta %51,7 osteopeni ve %17,25 osteoporoz, 8. dekatta %54,9 osteopeni ve %27,7 osteoporoz, 9. dekatta %45.5 osteoporoz mevcuttu. Kadın vakalarımızda osteopeni daha genç yaşlarda saptandı. Bu nedenle kadınlarımıza kemik metabolizması ve osteoporoz hakkında gençlik döneminden itibaren bilgi verilmesi kanaatindeyiz.

Anahtar Kelimeler: *Osteoporoz, frekans*

Osteoporosis (OP) is a major health problem through its association with fractures. Increased awareness of the scale of morbidity and mortality attributable to OP has lead to major efforts to develop new treatments aimed at preventing fractures (1,2). Alongside these developments there has been rapid evaluation of new radiological techniques for the noninvasive assessment of skeletal status. The technique most associated with the recent rapid development in clinical applications of bone densitometry is dual energy X- ray absorptiometry. It allows measurements of bone mineral density (BMD) of the spine and hip with high precision , short scanning duration and low radiation dose to patients. As in much countries, DEXA is routinely used to detect BMD values in Turkey (3-6). In these instruments reference values of countries were determined. The studies to determine the reference values of Turkish population are still going on. Our aim in this study was to detect the spine and femur BMD values of Turkish women who admitted to physical medicine and rehabilitation outpatient clinics and osteoporosis unit with various complaints.

MATERIALS AND METHODS

Age, weight, height, menapouse status of the women who admitted to Ankara State Hospital Physical Medicine and Rehabilitation outpatient clinics were evaluated. The women who had a cause that may lead to secondary OP like metabolic diseases, immobilization, drug usage, early menopause and surgical menopause were excluded from the study. A total of 1597 women aged between 31 and 89 years old were included in the study. Spinal (L2-4) and femoral (neck) BMD values of all women were measured by Lunar DPX 6956 (DEXA). The values were evaluated according to OP criteria of WHO. (DEXA BMD T score ≥ -1S.D is normal, T score between <-2.5 S.D and –1S.D is osteopenia, T score< -2.5 is osteoporosis) . We grouped these women according to decades and for the osteopenia , osteoporosis frequency. For statistical analysis, frequency analysis of SPSS for Windows was used. Values were given as mean ± SD (standart deviation).

RESULTS

The number of women in each decade, the mean values and standard deviation (S.D) of ages are given in Table I.

38% of cases in 5th decade and all of the women in further decades were in postmenapausal status. Min, max and mean and SD values of L2-4 and femoral neck t scores in each decade are shown in Table II.

Table I: The number of women in each decade, the mean values and standard deviation (S.D) of ages

	4th decade (30-39)	5th decade (40-49)	6th decade (50-59)	7th decade (60-69)	8th decade (70-79)	9th decade (80-89)
Number of cases	38	238	619	474	206	22
SD of age (year)	35,1±2,7	46,0± 2,4	54,1±3,3	64,2±2,7	73,2±2,5	83,1±3,1
Mean		43,6±3,3	46,6±4,5	47,4±5,0	47,2±6,8	46,8±4,

Table II: Min, max and mean and SD values of L2-4 and femoral neck t scores in each decade are shown in Table II.

	4th decade	5th decade	6th decade	7th decade	8th decade	9th decade
L2-4 t score						
Mean ± SD	0.7 ± 0.9	-0.6 ± -1.3	-1.1 ± 1.4	-1.9 ± 1..5	-2.0 ± 1.5	-2.2 ± 1.6
(min-max)	(-2.3- -1.8)	(-4.1- -3.81)	(-6.8- -4.7)	(-6.7- -3.8)	(-6.0- -2.3)	(-4.8- -0.4)
Femoral t score						
Mean ± SD	0.2 ± 1..3	-0.3 ± 1.0	-0.5± 1.1	-1.4± 1,0	-1.8 ± 1.0	-2.4 ± 0.8
(min-max)	(-4.7- -2.0)	(-3.7- -2.8)	(-5.3- -3.9)	(-5.3- -1.7)	(-5.2- -0.5)	(-4.0- -1.0)

The incidence of normal, osteopenia and osteoporosis at L2-4 according to T scores 4th to 9th decades are shown in Table III.

Table III: The frequency of normal, osteopenia and osteoporosis at L2-4 according to T scores 4th to 9th decades

	4th decade	5th decade	6th decade	7th decade	8th decade	9th decade
Normal	64,7 %	55,3 %	43 %	21,2 %	24,5%	18,5%
Osteopenia	35,3 %	39,2 %	41,1 %	41,4 %	32,4 %	27,3 %
Osteoporosis		5,5 %	15,9 %	37,4 %	43,1%	54,5 %

The distribution of the normal, osteopenia and osteoporosis in femoral neck t scores can be seen in Table IV.

Table IV: The distribution of the normal, osteopenia and osteoporosis in femoral neck T scores

	4th decade	5th decade	6th decade	7th decade	8th decade	9th decade
Normal	83,2 %	74 %	62,8 %	31,1 %	17,4%	
Osteopenia	16,8 %	24,3 %	34,7 %	51,7 %	54,9 %	54,5 %
Osteoporosis		1,7 %	2,5 %	17,2 %	27,7 %	45,5 %

DISCUSSION:

In this study we evaluated osteopenia and osteoporosis incidence of women in different decades of female subjects. Osteoporosis and osteopenia were determined according to the WHO criteria. Osteopenia was found to be apparent from the 4th decade in both L2-4 spine and femoral neck regions and osteopenia and osteoporosis incidence increased continuously to further decades. The mean of menopause ages were about 40 years of age. As the bone resorption phase of remodelling is increased after menapause, the occurence of osteopenia and osteoporosis at 5 th decade can be accepted as normal (7,8). In our study group osteopenia was found to begin from the younger ages. If the daily calcium (Ca) intake and sunlight exposure of the Turkish women are analysed, it can be

seen that due to beliefs of religion most of the women who admitted to our polyclinics had sunlight exposure to only their hands and faces and due to economic problems most of them could not buy milk and milk products. This may be a cause of osteopenia occurence at younger ages.

Donne et al examined the osteoporosis incidence and established BMD profiles in Irish female. They found 42% spinal BMD values less than 2 S.D at 55-59 years, 54% at 60-64 years, 72 % at 65-69 years and 69% at older than 70 years. They also pointed out that the younger age groups had 18,8% low spinal BMD values (9). In our cases we found an increase in OP in 6th and 7th decades. In Smeets et al's study in which low BMD prevalence in Dutch perimenopausal women (ages between 46-54 years) was investigated, osteopenia and osteoporosis prevalence at lumbar spine were found to be 27,3% and 4,1% respectively. In our cases we found 39,2% osteopenia, 5,5% osteoporosis in 5th decade and 41,1% osteopenia and 15,9%OP in 6th decade. Our results showed that BMD of our female were lower than Dutch women of the same age group (10).

In a study carried out in USA, percentage of women below -2,5 SD at the femoral neck were 3,2%, 13,1% and 28,2% at 50-59 (6th decade), 60-69 (7th decade) and 70-79 (8th decade) years respectively (11). Our results at these age groups were similar to this study being 2,5%, 17,2% and 27,7% respectively. In the same study the OP percentage was found to be low (5-10%) in the early postmenopausal decades; and the ratio increase to 20% at 60-69 years and 35-40% at 70-79 years (11).

In our study the decrease in both lumbar and femoral T scores began from the 50 years of age and with a decline in BMD and the OP percentage was found to be the highest in the 9th decade.

In a multicenter study carried out in Turkish population by Dilsen and her collagues, both lumbar and femoral neck BMD values after 6th decade were found to be significantly lower than previous decades (12).

In a research of Mexican women a significant loss in BMD was observed from 40 to 69 years of age at the lumbar spine and up to 8th decade at the femoral neck (13).

In an investigation carried out in 1725 Irish female aged 15-70 years, the nonnormal BMD values were 42%, 54%, 72,5% and 69% in 55-59, 60-64, 65-69 and 70+ age groups respectively (9).

In Doghert and Al-Marzouk's study the BMD values at lumbar spine and proximal femur of Kuwaiti women aged 20-79 years were compared with Caucasians/ North European women over 6 decades of age and no statistically significant differences in BMD were detected between two groups (14).

In another study of 131 healthy Puerto Rican female, BMD was measured by Hologic model 1000 and the decrease in BMD from peak values to that at age60-69 years were 18% for the lumbar spine, 16,3% for the femoral neck, 30,1% for the Ward's triangle and 12,4% for the trochanter (15). Lumbar spine and proximal femur BMD of 717 healthy Finnish female aged 20-70 years were evaluated and the overall decreases in BMD from the peak values to those at age 65-70 years were 20,4%, 19% and 32,6% in the lumbar spine, femoral neck and ward's triangle respectively. As lumbar BMD was lower and BMDs in the proximal femur were higher in Finnish women than in white American women; importance of national reference values for BMD measurements was emphasized (16).

A research carried out for the BMD reference data in Greek population, 4400 healthy women aged 25-80 years were analysed. Greek data was compared with American and Italian data. There was a statistically significant difference between Greek and American values of all age groups, the Italian values were closer to Greek data. It was concluded that for each country it would be better to use their own reference ranges in assessment and treatment of OP (17).

In a study carried out in among 429 women from 20 t0 49 years no significant change in BMD was found at any site and bone loss was rapid at all sites during the first decade after menopause. An increase in spinal BMD in 8th decade was reported and it was stated that this was due to osteoarthritis of the spine (18).

The results among different ethnic groups showed differences in BMD values and investigations in healthy younger populations of different ethnic groups can be done. In a longitudinal study in which ethnic and gender differences in bone mineral acquisition were examined, black and Asian females and

Asian males were reported to reach a plateau in BMD earlier than the other ethnic groups. In this study the use of gender and ethnic specific standards were recommended when interpreting pediatric bone densitometry data (19).

Bahannon's review focused on racial differences in women's BMD and pointed out that American African women began menopause with higher BMD and had lower rates of bone loss afterwards which accounted for their decreased incidence of OP and related fractures. The BMD values of this group was similar to caucasian female (20).

Calcium and vit D intake, smoking and physical activity are among the factors which might cause differences in BMD values in different ethnic groups (3-5).

In an investigation of osteoporotic fracture incidence in West African and Caucasian adults osteoporotic fracture rates were found to be different in ethnic groups (21).

Tsai and his collagues stated that in healthy Chinese men age and ethnicity effected the BMD values (22).

The small differences between BMD measurements could be due to genetic and environmental factors, different criteria used in selection of cases and different instruments used for measurement (23-25).

In northern Mediterranean countries BMD values showed small differences. As the body weight of female and male French population was approximately 5 kg less then the population of Scandinavian countries, the BMD was less then Scandinavians (26). Spanish values were between these two (27).

The BMD values of the black population was 6-10% higher than white population and Asian people had 5-10% lower BMD's (28,29,30).

According to the results of our study osteopenia and osteoporosis percentages were parallel to USA and Europe studies. We found that our female had lower BMD values at younger ages, especially premenopausal BMD values were lower. In postmenopausal period the values were more or less similar to USA and Europe values. The findings of Dilsen at al's in healthy Turkish population were parallel with ours (12).

Osteoporosis is a widespread disesase which can be a leading cause of mortality and morbidity and which can be prevented. The reference values of the manufacturer's might not reflect that of local population and this might lead to higher osteopenia and OP incidence in that population; unnecessary anxiety and treatment burden of the population would be the end result (30-32).

The results of our study indicate that reference values for the Turkish women should be determined as soon as possible and OP should be diagnosed and treated according to the values of Turkish women.

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