The prevalence and the age at the onset of menopause in Turkish women in rural area

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ABSTRACT

Objectives: To find out the prevalence of natural menopause among Turkish women according to age and certain demographic variables in a specific rural area.

Methods: This cross sectional study was carried out in Silivri district of Istanbul, Turkey between January and May 2000. Included in the study were 845 women between the ages of 30–60 years, not undergoing any hormonal replacement, living in the villages of Silivri district, Istanbul, Turkey. The participants were asked for their ages, level of education, number of pregnancies, age at menarche, presence of menstruation, age at the onset of menopause, physical activity outside home and the use of oral contraceptives. Females declaring at least one year of amenorrhea were accepted as being in menopause.

Results: The median age for menopause was 47 years. Of the total 845 participants, 326 women were found to be in natural menopause. The prevalence of menopause was estimated as 8.6% for females younger than 40 years, 31.8% for females between the ages 40–45 years and 80.9% among females older than 45 years. Any of the variables

questioned in our study have an effect on premature onset of menopause, but we found that never been pregnant (*p*=0.037, odd ratio (OR)=2.221, 95% confidence interval (CI)=1.048, 4.707) reduces the reproductive period, and the age at menarche younger than 13 prevents early menopause (*p*=0.000, OR=0.336, 95% CI=0.195, 0.579). Furthermore, both lead to early onset of menopause. Hazard ratios of the variables that have an effect on the onset of early menopause are calculated as 2:10 (95% CI=1.01, 4.39) for those who were never been pregnant and 1:10 for those with the menarche ages over 13 years (95% CI=0.68, 1.78).

Conclusions: There was a noticeably high percentage of females (8.6%) younger than 40 years who were entering menopause. On the other hand, an early onset of natural menopause among Turkish women living in this rural area was found to be associated with never been pregnant and their age of menarche.

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Although menopause is an inevitable event for women, its age at the onset shows interpersonal variation. It is possible to observe menopause at an early age in some females, while in the later age in others. Menopause is the period when plenty of physiological and biochemical changes occur in the body.[1] Menopause was also defined as a natural phenomenon consisting of follicular atresia and decrease in ovarian hormonal secretions.[2]

Age at the onset of menopause is associated with the risk for the onset of several chronic diseases such as cardiovascular diseases, breast and endometrial cancers and also osteoporosis.[3,4] Due to these risk, age at the onset of menopause is a popular subject, and has generated a number of studies.[5-8] Some of these studies mentioned the association between early onset of menopause and smoking, nulliparity, low socioeconomic status and low level of education,

while some studies mentioned the association between later onset of menopause and high socioeconomic status, prolonged breast feeding and the use of oral contraceptives.[9,10] The age at the onset of natural menopause has been reported between 45-55 years of age for all over the world. Countries being in the cold climate zone, socio-economically developed and having high literacy rate reported the age at the onset of menopause as higher than the countries being in the hot climate zone, socio-economically developing and having low literacy rate.[11-13] This study aims to determine the prevalence and the age at the onset of menopause and to find out the risk factors that affect the age at the onset of menopause. The strength of this study is in the calculation of hazard risk values for these risk factors mentioned.

Women live more than one third of their life in postmenopausal period. Social and health problems beside the climacteric symptoms affect women's lives. Women's health problems in this period need special effort and health services.[14] Management of menopause is a routine practice in developed countries, but this practice is still demanding for Turkey.[15] Turkey, as a developing country with middle-income and lower health indicators such as high infant and mother mortality rate, ought to give priorities to basic health services in order to have better health outcomes. But it seems that increasing number of females at menopause will cause a new public health problem in the near future.

This study was performed to find out the prevalence of natural menopause and related factors on a women population of 30-60 years living in a rural health center area in Istanbul.

Methods. The study was carried out in Silivri district of Istanbul in between January and May 2000. The district lies 60 km west to the center of Istanbul. This district was chosen because of its heterogeneous population due to receiving domestic migrants from all parts of Turkey. The population living in Silivri district constitutes a good sample representing the Turkish population.

The so called "Household Determining Forms" have to be filled and kept by the primary health care officers in Turkey. These forms contain data regarding the demographic, cultural, economic properties and physical conditions of each member of the household. These forms are highly reliable due to regular annual revisions.

The total number of female population between the ages of 30–60 years was 8200 in the year 2000. One thousand female subjects were selected by proportional sampling, but additive selection was used for the females younger than 45 years due to low prevalence of natural menopause at the younger age. All subjects were given a questionnaire, which included questions regarding age, level of education, number of complete pregnancies, age at menarche, presence of menstruation, age at the onset of menopause, physical activity outside the home, use of oral contraceptives or hormonal replacement therapy and history of surgically induced menopause as their impacts had been demonstrated in previously published studies by midwives working in Silivri district, Turkey.[16,17] With the face–to–face interview method, the questionnaire forms were marked or filled by midwives. One hundred and forty of the subjects receiving hormonal replacement therapy and 15 with surgically induced menopause were excluded from the study. Females declaring at least a year of amenorrhea were accepted as being in menopause.[18]

Menstrual status of the females were investigated according to 3 age clusters: younger than 40 as premature, between the ages 40-45 years as early and older than 45 years as natural according to the classification of menopause by World Health Organization.[14] The prevalence of menopause was determined for each age cluster as well as for each characteristic. Data were analyzed by Chi-square test and *p* values below 0.05 were considered statistically significant. Cox regression analysis was used for the determination of effective variable on the onset of menopause. Variables where the results of the Chi-square test was less than 0.1 were included in the Cox regression model. Postmenopausal events constitute the dependent variable of the model. Reproductive period in years constituted the time variable of the model, whereas the other variables were the independent variables of the model. Cox proportional hazard regression was used for the variables to determine the hazard ratios (HR) at the onset of menopause for the females under the age of 45 years.[19]

Results. Of the total women, 326 (38.6%) were found to be in natural menopause. The mean age of natural menopause was found to be 47.5 ± 3.9 years, where median age was found as 47 years, the lowest age of onset of menopause was 32 years and the highest age was 58 years.

The distribution of the onset of natural menopause according to age groups is shown in **Table 1**. According to this distribution, the prevalence of menopause was determined as 8.6% among females younger than 40 years, 31.8% among females between the ages 40–45 years, and 80.9% among females older than 45 years.

Among the female patient younger than 40 years of age and women having physical activity outside home had the highest menopause prevalence (36.1%) whereas among women who was never been pregnant a prevalence of 20% was found (**Table 2**). For females between the ages 40–45 years, the highest prevalence was found among women who were never been pregnant (55.6%) (**Table 2**). Among those females older than 45 years, the prevalence of those still

having menses is 40% among oral contraceptive users (**Table 2**).

According to Cox regression analysis, we found that any of the variables in our study has an effect on premature onset of menopause, however, never been pregnant (*p*=0.037 OR: 2.221 95% CI: 1.048, 4.707) reduces the reproductive period, which is defined as the time interval between the onset of menarche and the onset of menopause, and age at menarche younger than 13 years prevents early menopause (*p*=0.000 OR: 0.336, 95% CI: 0.195, 0.579) and both variables lead to early onset of menopause.

According to Cox proportional hazards regression, among the females under the age of 45 years, women who were never been pregnant were 2.10 (95% CI: 1.01, 4.39) times more at risk for an earlier onset of menopause than those who had been pregnant, where this risk is 1.10 (95% CI: 0.68, 1.78) times higher than the subjects whose age at menarche was 13 years and over. (**Table 3**).

Discussion. In this study the risk factors determined by the Cox proportional analysis are further analyzed by hazard ratio method, and thus,

Table 1 - The distribution of menstrual status according to age clusters.

Age Cluster	No. of patients (%)		
	Regularly menstruating	In menopause	Total
40<	331 (91.4)	31 (8.6)	**362 (42.8)**
40-45	133 (68.2)	62 (31.8)	**195 (23.1)**
45>	55 (19.1)	233 (80.9)	**288 (34.1)**
Total	**519 (61.4)**	**326 (38.6)**	**845 (100)**

Table 2 - Menopause prevalence according to some characteristics of women among females younger than 40 years old, between 40-45 years old and older than 45 years old.

Characteristics	No. of patient (%)		
	Younger than 40 years old	Between 40-45 years old	Older than 40 years old
Number of pregnancies	*p*=0.23	*p*=0.27	*p*=0.09
0	3 (20)	5 (55.6)	9 (77.8)
1	20 (7.6)	37 (29.8)	1023 (75.8)
>1	8 (9.4)	20 (30)	122 (85.9)
Oral contraceptives	*p*=0.67	*p*=0.19	*p*=0.00
Used	12 (7.8)	22 (37.2)	24 (60)
Never Used	19 (9.1)	40 (35.1)	248 (84.3)
Age at menarche	*p*=0.56	*p*=0.77	*p*=0.33
<12 years	8 (8.6)	16 (49)	50 (87.7)
12-13 years	20 (9.5)	35 (31)	128 (79.5)
>13 years	3 (5.1)	13 (39.4)	55 (78.6)
Physically active outside the home	*p*=0.04	*p*=0.02	*p*=0.01
Yes	13 (36.1)	24 (44.4)	33 (64.7)
Never	18 (6.8)	38 (27)	200 (84.4)
Length of education	*p*=0.01	*p*=0.33	*p*=0.04
<8 years	14 (5.9)	41 (29.7)	197 (83.1)
>8 years	17 (13.6)	21 (36.8)	36 (70.6)

numeric risk values are calculated for them. Ozdemir and Col[15] found the average age at natural menopause as 47 ± 4.2 years for females between the ages 50–65 years living in Ankara. In another study Carda et al[20] reported the mean age of menopause in Turkey as 47.8 ± 4.0 years. The mean age at the onset of menopause is nearly the same although these 3 studies had been carried out in different parts of Turkey at different times. In our study, the average age at the onset of natural menopause was similar as in countries with hot climate, but was lower compared with that of cold countries.[11-13] Median age was found as 47 years for the onset of natural menopause, while it was reported as 51 years by Carda et al.[20] Although both studies had been carried out in Turkey this difference might arise from their different sites of conduction. The latter was carried out in a menopausal clinic, where the others on the field. Interestingly, the median age for onset of the natural menopause was reported as 51 years for contemporary Greek women.[21] This difference for the median age at the onset of natural menopause might arise from the different status of the females between the 2 studies. The lowest age of onset of natural menopause was 32 years, whereas the highest was 58 years in the study. This age range might be explained by the influences of genetic factors on the onset of menopause,[22] while early ovarian ageing before the age of 32 years is reported in 10% of women in the general population.[23]

Early onset of natural menopause is not expected to be more than 1-2% in a community.[24,25] Interestingly, our study has revealed that premature or early age onset of menopause is more than expected. Highest prevalence of menopause for the females younger than 40 years was observed among those who have physical activity outside the home. This situation can be explained by the impact of the education where the more educated females are expected to work and have professional carrier. Furthermore, the prevalence of menopause for the nulliparous females having the onset of menopause before the age 40 years was determined as 20%. This situation suggests the impact of the parity on the age of the onset of menopause.[26]

Use of oral contraceptives has previously been declared as a determining factor on the onset of menopause in many studies. Oral contraceptive use is supposed to delay the onset of menopause.[26-28] Similarly, we found that the prevalence of still having menses was 40% among oral contraceptive users after the age 45 years.

The effects of the variables in the study on the reproductive period were investigated with the Cox proportional analyses. According to this analyses, the onset of menarche before the age 13 years and never been pregnant have impact on the reproductive period. The onset of menarche before 13 years prolongs the reproductive period, whereas never been pregnant shortens it. There are many studies that have demonstrated the relationship between parity and late onset of menopause.[4,29-31] Furthermore, the relationship between early onset of menarche and late onset of menopause were investigated and demonstrated in many studies.[32,33] In controversy,

Table 3 - The influence of some characteristics of women on reproductive period.

Variable	Signifi-cance (*p*)	Odds ratio	95% Confidence interval	
			Lower	Upper
Use of oral Contraceptives	0.961	0.989	0.639	1.531
Age at menarche <13 years	0.000	0.336	0.195	0.579
Never been Pregnant	0.037	2.221	1.048	4.707
Physical activity outside the home	0.059	1.665	0.981	2.826
Education length <8 years	0.479	0.825	0.485	1.405

Table 4 - The hazard ratio of certain characteristics in women undergoing early onset of menopause.

Variable	Number of women at risk			Number of women observed in menopause			Number of women expected to be in menopause			Hazard ratio	95% CI	
	HP	NP	Total	HP	NP	Total	HP	NP	Total		Lower	Upper
Number	533	24	557	85	8	93	89	4	93	2:10	1.01	4.39
Age at Menarche	<13	>13		<13	>13		<13	>13				
Number	142	415	557	22	71	93	23.7	69.3	93	1:10	0.68	1.78
HP - had a history of pregnancy, NP - never been pregnant before.												

Ozdemir and Col[15] found a relationship between early age menarche and early age onset of menopause in their study.

In this study, we tried to estimate the hazard risk ratios for the factors that were found to be correlated with the age at the onset of menopause. Women never been pregnant have 2.10 HR (CI: 1.01, 4.39) for early onset of menopause than women who have been pregnant, while women had menarche age later than 13 years have 1.20 HR (CI 0.68, 1.78) for early onset of menopause (**Table 4**). In another study, it was reported that women with any children had older ages of menopause (OR= 0.58, 95% CI: 0.25, 1.36).[30]

Earlier onset of natural menopause among Turkish women lives in Silivri district of Istanbul is strongly associated with never been pregnant and menarche age older than 13 years. The median age of the onset of menopause is 47 years in our study. There was a noticeably high percentage of females (8.5%) younger than 40 years entering menopause. On the other hand, an earlier onset of natural menopause among Turkish women living in this rural area was found to be associated with never been pregnant and age at menarche.

According to the results of our study, the median age for menopause does not differ from many other studies. But the prevalence of premature and early menopause seems to be higher. Never having been pregnant and older age at menarche seems to have major risk for premature and early onset of menopause in our study. We strongly recommend that those women in our study, who experienced menopause before the age of 40 years be checked for existence of cardiovascular disease due to known prevalence of cardiovascular diseases among such women[34-36] and the risk for diabetes mellitus,[33] and the bone mineral density.[37]

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