

Possible factors affecting the age at menopause among women in the central anatolian region of Turkey

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Summary

Objective: We aimed to investigate the age at menopause and possible related factors in a Turkish population.

Study Design: In a three-year period, a retrospective analysis of 541 spontaneous menopause cases were evaluated. All postmenopausal women with spontaneous cessation of menses for ≥ 12 months and serum FSH levels > 40 IU/l were included in the study. Sociodemographic status, reproductive and medical history, menopausal symptoms, and previous contraceptive and hormonal therapy use were assessed based on an interview using a standardized information system. Age at menarche, parity, menopausal age of mother and sister, history of lactation, physical activity, cigarette smoking, oral contraceptive use and body mass index (BMI) were assessed.

Results: Menopausal age of the enrolled cases was positively correlated with mothers and sisters' ages at menopause. Postmenopausal smokers had an earlier age at menopause compared to non-smokers.

Conclusion: Cigarette smoking results in earlier menopause in the Turkish population. Menopausal ages of mothers and sisters clearly correlated with the age at menopause.

Key words: Age at menopause; Cigarette smoking; Menopausal age of mothers/sisters.

Introduction

Early menopause is associated with increased risk of cardiovascular disease, osteoporosis and gynecological and breast cancers [1-4]. Hence, determination of related factors with menopausal age can help identify women at risk who may benefit from mainly lifestyle changes and early hormonal replacement therapy.

Several studies have investigated the possible related factors with menopausal age, including age at menarche, parity, educational status, cigarette smoking, physical activity, diet, lactation, and menopausal age of mother and sister, all of which pointed out different and sometimes conflicting results [5-14, 17]. Most of these data come from North European and North American populations. As in the case of various perceptions of menopause, age at menopause and related factors can also vary in different populations.

This study was conducted to investigate age at menopause and possible related factors

Materials and Methods

Among women visiting our menopause center in a university hospital from August 2000 to April 2003, 541 spontaneous menopause cases were retrospectively evaluated and constituted our study group. As an indicator of postmenopausal state, natural cases with cessation of menses for 12 or more months and serum FSH levels > 40 IU/l were included. Women with surgical menopause and premature menopause were excluded.

During their first visit to the clinic, data regarding sociodemographic status, reproductive and medical history, menopausal symptoms, previous contraceptive use and the use of hormonal

therapy were collected with a structured interview using a standardized information system. Age at menarche, parity, menopausal age of mother and sister, history of lactation, physical activity, cigarette smoking, oral contraceptive use, and body mass index (BMI: kg/m^2) were the parameters investigated in the study. Packages/year cigarette use was defined as the cumulative number of cigarette packages smoked in a month. The Institutional Ethics Committee approved access to patients' records for the objective of the present study.

Statistical analyses were performed using the statistically package for social sciences (SPSS 10.0, Chicago, IL, USA). Pearson's and Spearman's correlation rank analysis, and the independent Student's t-test were used. Data were expressed as mean \pm standard error of mean (SEM). A p value of < 0.05 was considered statistically significant.

Results

Mean age at menopause was 46.3 ± 0.21 years in the study population. Menopausal age of the enrolled cases was positively correlated with mothers ($p = 0.02$) and sisters' ages ($p = 0.001$) at menopause. As shown in Table 1, cigarette smoking was negatively correlated with age at menopause ($p = 0.04$). Physical activity, lactation and combined oral contraceptive (COC) use were not related with menopausal age. However postmenopausal smokers had an earlier onset of menopause compared to non-smokers (Table 1).

Discussion

Although age at menopause is reported to be around 50 years in the Western world, it was found to be in the early 40's in Yucatan Mayan women [5]. Hence, it is population specific. Furthermore, there can be some substantial

Table 1. — Possible related factors with menopausal age and the correlations for 541 women.

Parameter	Mean \pm SEM of the parameter	Menopausal age - correlation results
Parity	2.5 \pm 0.1	NS
Age at menarche	13.6 \pm 0.1	NS
BMI	27.1 \pm 0.4	NS
Smoking (package year)	13.5 \pm 0.9	$r_p = -0.127, p = 0.04$
Mother's menopausal age	45.7 \pm 0.5	$r_p = 0.172, p = 0.02$
Sister's menopausal age	46.0 \pm 0.6	$r_p = 0.294, p = 0.001$

BMI: body mass index; SEM: standard error of mean; NS: nonsignificant; r_p : Pearson correlation coefficient.

Table 2. — Additional possible related factors with menopausal age and the correlations for 541 women.

Parameter	Frequency (%)	Menopausal age	
		Mean \pm SEM	Correlation results
Physical activity	yes	54.0	NS
	no	46.0	
Lactation	yes	91.9	NS
	no	8.1	
COC use	yes	16.8	NS
	no	83.2	

COC: combined oral contraception; NS: nonsignificant.

Table 3. — Effect of smoking on menopausal age.

Cigarette Smoking		Menopausal age	
		Mean \pm SEM	p value
yes		45.6 \pm 0.4	0.03
no		46.6 \pm 0.3	

SEM: standard error of mean.

differences between two sociocultural classes in the same country, as seen in Indonesia. For instance, in Indonesia age at menopause in an educated group was found to be 50.2 years while it was 46.0 years in rural regions [6]. Another study in a Turkish population reported that the mean age at menopause in the population was 47.8 years [7]. Since our study population was composed of women mostly living in city centers and belonging to a relatively high sociocultural status, it may not reflect the actual menopausal age in rural areas.

Concerning the factors affecting ovarian follicular dynamics, early exhaustion of ovarian follicles corresponds with early menarche and, reversely protection of available follicles and thus delayed menopause occurs in cases of increased parity, lactation and oral contraceptive use. The results of this study did not reveal any association between these factors and menopausal age. However, there have been many studies, reporting conflicting results about a possible relationship of menopausal age and early menarche, parity, lactation and oral contraceptive use [7-13].

It was found that age at menopause was later among women with a high BMI in a Japanese [14] and Turkish population [7]. However, our results contradicted such findings that were also found in a large Italian study [12].

Targerson *et al.* [14] suggested a close relationship between menopausal ages of mothers and sisters, reflecting the inherited side of the issue [14]. Our results showed that when all possible factors were taken into account and linear regression was applied, the only factor associated with menopausal age was the sister's age at menopause.

Smokers were shown in many studies to have delayed menopause [15, 16]. Although the exact mechanism of that relationship is not clear, it is known that it has an anti-estrogenic effect [17] and may bring on early menopause due to destruction of oocytes by the polycyclic aromatic hydrocarbons within the cigarettes [18]. Many studies report an earlier menopausal age, a year difference ranging from 0.75 to 1.74 years [13, 19] and also our study found that smokers had a menopausal age one year earlier than nonsmokers.

In conclusion, although our study was carried out on a relatively select population of Turkish women, cigarette smoking was found to cause earlier menopause and menopausal age of sisters is clearly related to women's age at menopause.

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