Original Article

Socio-Economic Determinants of Age at Menopause

Mussarat Batool[1], Saima Kiran[2], Syeda Batool Mazhar[3]

[1]Assistant Professor, [1]Senior Resident, [3]Professor and Chairperson of Obstetrics and Gynaecology, Obstetrics and Gynaecology, MCH Centre, Pakistan Institute of Medical Sciences, Islamabad, Pakistan

Correspondence: *Dr. Mussarat Batool*
Assistant Professor, Dept of Obs & Gynae, MCH Centre,
Pakistan Institute of Medical Sciences, Islamabad, Pakistan
mussratbatool@live.com

Abstract

Objective: To assess age at menopause and its association with socioeconomic determinants across the lifecycle.

Methodology: In this cross-sectional study, two hundred and one post menopausal women were interviewed using pre-designed questionnaires from July 2016 to October 2016 at MCH Centre, PIMS, and Islamabad. Patients who had history of hysterectomy or oophorectomy were excluded. The main outcome measure was age at menopause and the secondary outcome measure was a correlation between socioeconomic status and age at menopause. Socioeconomic status was defined using indicators including education, monthly income, father and spouse occupation, frequency of meat intake etc. The socioeconomic indicators were associated with menopause using a chi - square test. A p-value < 0.05 was considered statistically significant.

Results: Among 201 women the mean age at menopause was 47.96±4.15 years. The factors as a child found to be significantly associated with early or premature menopause were father occupation of laborer, family size > 10 persons (p value <0.001) and less meat intake (p-value <0.001). As an adult, rural residence (p value <0.001), family size >10 persons, less meat intake (p value <0.001) and monthly income < 30,000, which are all indicators of poor socioeconomic status, were significantly associated with early or premature menopause. However family history of early and premature menopause was not significant associations.

Conclusion: Poor socioeconomic status in childhood as well adulthood is associated with early age at menopause.

Keywords: Menopause, socioeconomic status, socioeconomic determinants, premature menopause, lifecycle, hysterectomy, oopherectomy, education.

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Introduction

Menopause is a term used for amenorrhea for consecutive 12 months, resulting from the loss of ovarian follicular activity and it represents the end of a women's reproductive life. [1-3] It is usually diagnosed by vasomotor symptoms and a prolonged episode of amenorrhea.[2] Different studies have shown that ethnicity, genetic factors, lifestyle, socioeconomic status and environmental factors play a major role in the onset of menopause.[1-3]

In a woman's life menopause is an important social and medical transition and is a known risk factor for several chronic diseases like osteoporosis, coronary heart disease and cancer.[4,5] The association of early menopause with increased mortality from cardiovascular diseases have been reported in several studies.[3,4] While an older age at menopause has been found to be associated with decreased risks of incident heart failure but increased risk of breast cancer.[4]

The median age at menopause vary among different populations. In western world median age 51.4 years is reported while in Asian women age at menopause is reported between 49 to 50 years.[3] According to some studies the age at menopause in western population has increased in recent decades,[6,7] possibly due to changes in socioeconomic condition.

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Different studies have shown a significant relationship between poor socioeconomic status and an earlier age at menopause.[8,9] Parastoo Golshiri and colleagues found significant relationship between early menopause with lower socioeconomic status, high parity and higher age at marriage[3] while late menopause was found to be associated with education,[10] higher income, mother with late menopause and later-age at first pregnancy.[11] Cigarette smoking has also been found to be a contributing factor in early menopause, shorter reproductive years, and low bone mineral density.[10-12]

The aim of this study is to assess the mean age of menopause and the association of socioeconomic status across the lifetime with the age at menopause.

Methodology

After approval by the ethical committee of the hospital, 201 post menopausal women were interviewed in MCHC OPD, Pakistan institute of medical sciences, Islamabad, Pakistan from 1st July 2016 to 31st October 2016. Women with natural menopause at least one year prior to the study were interviewed. Women with a history of hysterectomy or oophorectomy prior to menopause and those taking HRT were excluded from the study. Eligible candidates were interviewed by postgraduate residents. Before collecting data, the nature of the research was explained to all the participants and verbal consent was taken. Demographic, reproductive history, lifestyle and socioeconomic status indicators were collected using pre-designed questionnaires. Demographic variables included age, geographical area, weight, height, marital status and education level. Reproductive history, characteristics noted, were age at menarche, age at menopause, parity, no of abortions and contraceptive use. Lifestyle characteristics like smoking and naswar use were inquired. Socioeconomic status was determined by education, monthly income, father and spouse occupation, no of rooms and bathrooms in house, car ownership, family size, and frequency of meat intake.

Main outcome measure was age at menopause, determined by asking a woman to recall her age at the last menstrual period and whether she was menstruating or not during the last one year. The secondary outcome measure was a correlation between socioeconomic status and age at menopause. Statistical analysis was done using SPSS software for Windows version 16. Descriptive data are reported as numbers and percentages for categorical variables and mean and standard deviations for continuous numerical variables. The socioeconomic indicators were associated with menopause using a chi - square test. A p-value < 0.05 was considered statistically significant.

Results

In this study, a total of 201 postmenopausal women were enrolled who were all above 35 years of age. The majority of the women 129 (64.2%) were living in Punjab followed by 40 (19.9%) from Khyber Pakhtunkhwa. One hundred and forty women (70.0%) were illiterate. Among the 201 women studied, 145 (72.1%) were married and 5 (2.5%) were unmarried while the rest of 51 (25.4%) were divorced or widowed. Almost one third of population were earning less than 10000 Pakistani Rupees (PKR) per month and one fourth were earning more than 30000 PKR per month.

The mean age of the study population for menopause was 47.9 $\pm$ 4.1 years. Fifty six women (27.9%) had early menopause while 8(4%) had premature menopause. Mean age at menarche was 13.3 $\pm$years (10-18). Only 12(6%) women had menarche at less than12 years while rest had menarche after 12 years of age. Regarding their residence, as a child, 77.6% had rural residence while during adulthood 53% were living in rural areas.

Mean family size regarding sibling was 7.8% while mean number of children was 4.8 $\pm$ 2.5. There were 112 (55.7%) women who had 1 to 5 children, 79 (39.3%) had more than five issues whereas 10 (5.0%) were nulliparous. A significant number of women 80 (39.8%) had 1-3 miscarriages in their life whereas 9 (4.5%) had more than 3 miscarriages. Only 38 (18.9%) women had practiced any contraception and most frequent use was of intra uterine contraceptive device in 12 (6.0%) and bilateral tubal ligation 15 (7.5%). Only 22(10.9%) were smokers and 21(10.4%) were taking 'naswar'. Moreover, 2 (1.0%) patients had ever used HRT. On average there were two earning members in the family.

There were 19 women with a family history of premature menopause (< 40 years), of which 9 (4.5%) were mothers, 9 (4.5%) sisters and in 1 (0.5%) aunt. Similarly, there were 20 women with family history of early menopause (< 45 years); of them, 5 (2.5%) were mothers, 8 (4.0%) sisters, 6 (3.0%) aunts and in 1 (0.5%) daughter with early menopause.

Further analysis was done based on groups made according to early and premature menopause group

and those with normal menopause group. Monthly income below 30000 PKR was found significantly associated with early or premature menopause. Patients who had > 5 children were more likely to have early or premature menopause. No miscarriage was significantly associated with early/premature occurrence of menopause in this study. No effect of other anthropometric or personal factors on the occurrence of early or premature menopause was observed in the study. (Table I)

Table I: Association of socio-demographic factors with early/premature menopause in the study (n=201)

	Early/premature menopause (n=64)	Normal menopause (n=137)	p-value
Current age (years)			
35 – 40	1 (1.6%)	0 (0.0%)	<0.001
41 – 45	8 (12.5%)	0 (0.0%)	
46 – 50	22 (34.4%)	15 (10.9%	
51 – 55	10 (15.6%)	44 (32.1%)	
56 – 60	12 (18.8%)	37 (27.0%)	
61 – 65	4 (6.3%)	23 (16.8%)	
66 – 70	2 (3.1%)	11 (8.0%)	
71 or above	5 (7.8%)	7 (5.1%)	
Monthly income (Rs.)			
< 5000	6 (9.4%)	14 (10.2%)	0.01
5000-10000	12 (18.8%)	34 (24.8%)	
10000-20000	13 (20.3%)	28 (20.4%)	
20000-30000	23 (35.9%)	21 (15.3%)	
> 30000	10 (15.6%)	40 (29.2%)	
No of miscarriages			
None	45 (70.3%)	67 (48.9%)	0.001
1-3	14 (21.9%)	66 (48.2%)	
> 3	5 (7.8%)	4 (2.9%)	
Weight (kg)			
45-55	9 (14.0%)	28 (20.4%)	0.62
56-65	27 (42.1%)	46 (33.5%)	
66-75	22 (34.3%)	41 (29.9%)	
75 or above	6 (9.3%)	22 (16.0%)	
Smoking			
Yes	3 (4.7%)	19 (13.9%)	0.05
No	61 (95.3%)	118 (86.1%)	
Family h/o premature menopause			
Mother	3 (4.7%)	6 (4.4%)	0.19
Sister	5 (7.8%)	4 (2.9%)	
Aunt	1 (1.6%)	0 (0.0%)	
Daughter	0 (0.0%)	0 (0.0%)	
None	55 (85.9%)	127 (92.7%)	

The factors of childhood and adulthood living status like father/brother occupation of the laborer was found significantly associated with early/premature menopause. Similarly, larger family size of > 10 persons (p-value, <0.001) and less meat intake (p-value, <0.001) was also found significantly associated with early/premature menopause. In adult life, the rural residence was found associated with early/premature menopause. Family size of more than 10 persons in the adult life) and less meat intake was also found related to early/premature menopause (p-value, 0.01). (Table II)

Table II: Association of childhood and adulthood living status with early/premature menopause in the study (n=201)

	Early/premature menopause (n=64)	Normal menopause (n=137)	p-value
Childhood residence			
Rural	12 (18.8%)	33 (24.1%)	0.39
Urban	52 (81.3%)	104 (75.9%)	
Father/brother occupation			
Laborer	55 (85.9%)	101 (73.7%)	0.02
Professional	9 (14.1%)	17 (12.4%)	
Businessman	0 (0.0%)	15 (10.9%)	
Unemployed	0 (0.0%)	4 (2.9%)	
Family size (childhood)			
1-5	14 (21.9%)	44 (32.1%)	<0.001
6-10	30 (46.9%)	81 (59.1%)	
> 10	20 (31.3%)	12 (8.8%)	
Meat intake (childhood)			
Daily	1 (1.6%)	5 (3.6%)	<0.001
1-2 times/week	37 (57.8%)	38 (27.7%)	
3-4 times/week	4 (6.3%)	15 (10.9%)	
1-2 times/month	16 (25.0%)	73 (53.3%)	
None	6 (9.4%)	6 (4.4%)	
Adulthood residence			
Rural	45 (70.3%)	62 (45.3%)	<0.001
Urban	19 (29.7%)	75 (54.7%)	
Family size (adulthood)			
1-5	15 (26.6%)	40 (29.1%)	0.01
6-10	30 (53.2%)	78 (56.9%)	
> 10	19 (29.6%)	19 (13.9%)	
Spouse occupation			
Laborer	30 (46.8%)	68 (49.6%)	0.43
Professional	16 (25.0%)	36 (26.3%)	
Businessman	6 (9.4%)	15 (10.9%)	
Unemployed	8 (12.5%)	16 (11.6%)	
Retired	4 (6.3%)	2 (1.4%)	
Meat intake (adulthood)			
Daily	3 (4.7%)	3 (2.2%)	<0.001
1-2 times/week	44 (68.8%)	62 (45.3%)	
3-4 times/week	6 (9.4%)	23 (16.8%)	
1-2 times/month	11 (17.2%)	47 (34.3%)	
None	0 (0.0%)	2 (1.5%)	

Discussion

In this study the mean age at menopause 47.96, is higher than 46.8 reported by Syeda Ali and colleagues of Pakistan[13] and lower than other countries, like in American and European populations it was found to be

51 years, 48 years for Iranian women, 50 years for Russian women, 51 in Czech towns and 52 years in Poland. [14] Highest mean age at menopause was seen in Europe and Australia, followed by the United States of America while the lowest mean was observed in African, Asian, and Middle Eastern countries.[3] This shows that women belonging to developing countries with poor socioeconomic status have an early onset of menopause.

Determinants of low socioeconomic status have a significant impact on age at menopause. Low monthly income of <30,000 PKR was found significantly associated with early age at menopause which was similar to findings of Iranian study.[11] Ling li and colleagues found that women reporting lifetime economic distress had increased rates of early menopause compared with women reporting no economic distress.[15] A meta-analyses (2014), reported no effect of income on age at natural menopause which is opposite to our results.[10]

Education which is a factor of high socioeconomic status is also associated with age at menopause. Maninder investigated the association of education with age at menopause and found a positive result.[5] similarly higher education was found to be related with a 15% lower risk of menopause in another study.[14] While lower education level is associated with earlier onset of menopause than women with higher education level. [15, 16]

Similarly, father's occupation of laborer and large family size which are all indicators of poor socioeconomic position were significantly associated with early menopause. Earlier menopause was seen in women working in lower occupational groups compared with those in higher occupational groups (p<0.0001).[17]

The relationship between diet and age at menopause has shown inconsistent results in different studies. Our study found a positive relationship between less meat intake, both in childhood and adulthood, with the early onset of menopause. Contrary to our study, no correlation was found between natural menopause age and diet in some studies.[5, 14] Sapre and Thakur found a delayed age at menopause in women who had high intake of total calories, high protein and carbohydrate intake.[18] The influence of dietary factors is due to their effect on serum estradiol levels.

A study by Abdollahi and collegues (2013) contradict the findings of our study, who reported that compared to others, mean age at menopause was lower in smokers and single women (46.6±2.80 years) but the differences were not associated significantly with menopause age (p-value, >0.05).[1] Different studies found a significant relationship between smoking and earlier age at menopause.[10-12, 14, 15, 18] Cigarette smoke contains polycyclic aromatic hydrocarbons which have a toxic effect on ovarian follicles resulting in decreased estrogen levels and hence menopause.

Although some studies have reported no association of family history with early menopause like our study, others have reported a strong association between mothers' and daughters' ages at natural menopause. [11] There was no association between weight and age at menopause in our study similar to findings of a Nigerian study.[17] Although other studies[15, 19, 20, 21] found a significant relationship between high BMI and later onset of menopause.

Rural or urban residence in adulthood was found significantly associated with age at menopause. Rural residence showed a significant association with early menopause (p-value, <0.001). Similar results were found in a study, [22] in which Brahmin women of urban residence experienced menopause at a later age as compared to those living in rural areas. Contrary to our results, an Indian study of 180 postmenopausal women found the mean menopausal age for rural areas 53.9 ± 4.37 (range 40-60 years) and urban areas 51.39 ± 4.6 (range 41-59 years) years.[23]

The results of different studies revealed that poor socioeconomic status leads to an earlier age of menopause. Most of these factors of poor socioeconomic status are modifiable, so proper policy making and steps to improve the living standards may improve the women's health.

Conclusion

A significant proportion of women had premature or early menopause in this study 64 (31.8%). Many socioeconomic parameters have been found significantly associated with early menopausal status which verifies findings of many previous studies on this topic. There is a need to conduct large scale studies with stratified sampling according to rural and urban areas to confirm the effect of living status and socioeconomic status on age at menopause.

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