Menopausal Health, Cognitive Status and its Correlates in Midlife: A Pilot Study on Rajput Women of Rural Agra

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ABSTRACT: Menopause is a time when a woman's body goes through a lot of changes, but it's not just about the body. Women's symptoms are influenced by their socio-cultural environment, which ultimately determines their lifestyle choices. Concurrently, decline in cognitive functioning associated with menopausal transition is also attributable to a variety of reproductive and socio-demographic factors in addition to purely biological causes. The aim and objective of this study is to evaluate cognitive status and menopausal health of Rajput women, as well as its correlates. Data on socio demographic, reproductive factors, cognitive status and menopausal symptoms was collected in rural Agra (North India). It was discovered that women's menopausal symptoms differ based on their lifestyle choices, with significant differences in symptom severity due to self-perceptions of health, caffeine consumption, and tobacco use. Cognitive status was related to caffeine consumption, age at first menstrual period, and number of incomplete pregnancies (miscarriages).

INTRODUCTION

Menopause is one point in a continuum of life stages for women and marks the end of their reproductive years. It is defined as the permanent cessation of menstruation due to loss of ovarian follicular function and decline in circulating blood estrogen levels (WHO, 1996). There is a dramatic increase in life expectancy due to healthcare technology and quality advancements. Hence, more years of life of a woman is spent in postmenopausal years. Because of estrogen deficiency following menopause and other hormone levels, there are few symptoms of menopause as experienced by women. This includes, hot flushes, night sweats, heart palpitation, sleep problems, dyslipidaemia, urogenital problems, joint pains, forgetfulness, depression, osteopenia, sexual problems etc. and are categorised mainly into physical, psychological vasomotor and urogenital symptoms of menopause (Heinemann *et al*., 2004).

Despite the fact that menopausal symptoms are quite common, previous research has been unable to determine whether a menopausal symptomatology should exist or not. This is due to cultural differences, as culture can affect the menopause symptoms experienced by women (Namazi *et al*., 2019). Also, because menopausal symptoms are primarily caused by differences in hormone levels, it is difficult to predict to what degree women will experience these symptoms; consequently, menopausal symptoms are not universal. One of the most common aspects associated with menopause is decline in cognitive ability. Although ageing is the greatest risk factor for this decline in cognitive function, the menopausal transition places an additional burden on women, as studies have hypothesised an association between a decline in oestrogen levels and cognitive impairment

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(Baumgartner & Daniel, 2021). Rural women's life experiences and knowledge differ greatly from those of the general urban population, as do their menopausal experiences. The sociocultural foundations of this aspect of women's lives impart distinct meanings to not only women but also their relatives. Moreover, as a result of globalisation, the populations of developing nations are becoming more diverse; therefore, it is crucial from an anthropological standpoint to document the experiences of rural women in settings with homogenous populations.

MATERIALS & METHODS

Study Design: This is a cross sectional study conducted in a village named Garhi Jagannath of Agra district, Uttar Pradesh, India. The majority of the population is comprising of Hindi speaking Rajput caste group of Hindu community. The participants for this study were selected on the basis of snow ball sampling technique. Being a pilot survey, the sample size for this study was 30 in the age group 37 to 60 years. Stages of the menopause were defined according to the SWAN criteria (Sowers *et al*., 2000) where pre-menopause was defined as no change in bleeding patterns; perimenopause as amenorrhea for less than 12 months and the phase just before final menstrual period (FMP) and post menopause where women were in amenorrhea for the past 12 consecutive months or more without any medication or surgery. The study also included women with surgical menopause (bilateral oophorectomy with or without hysterectomy), hysterectomy with one or two ovaries retained, and hormone use before FMP. Pregnant or lactating women, women undergoing hormone therapy, breast cancer (or any type of cancer) patients were excluded from the study. Data was collected after verbal and written informed voluntary consent from the participants.

Data Collection: A semi-structured interview schedule was prepared as data collection tool. Information on the socio-demographic details of the participants includes questions pertaining to present age (in years), education (as years of education and categorized in 0-illiterate, 1-8 primary, >9 high school and above), marital status, family type (nuclear or joint), socio- economic status (as per revised BG Prasad SES scale, 2022) (Bashar, 2022), years since living in village etc. Questions like age at marriage, age at menarche, age at first conception, age at FMP, gravidity, parity, number of miscarriages, menopausal status (pre menopause, peri menopause and post menopause) and type of menopause (natural or surgical) were asked for information on reproductive characteristics of the participants. Lifestyle variables included questions like self-perceived health, physical activity level, daily water intake, breakfast intake, frequency of meals daily, tobacco consumption and daily caffeine intake. Menopausal symptoms and cognitive status of the participants were assessed using standardized tools like Menopausal Rating Scale (MRS) and Montreal Cognitive Assessment tool (MoCA) respectively.

Statistical analysis: IBM SPSS version 26 was used for statistical analysis. Pearson Correlation and spearman correlation for ranked variables were used to find the degree and direction of association between MoCA and other variables and also for MRS and lifestyle variables. For testing the independence and significant association of variables, chi-square test was used.

RESULTS

Table 1 describes the socio-demographic profile of the study group where majority of the participants (86.7%) were married, 43.3% has education till primary school, 56.7% belonged to joint family and 90% of the participants living in the village since more than 20 years. 70% of the studied population belong to the upper socio-economic class, while only 3.3% belong to lower middle class on socio-economic scale.

TABLE 1

Socio-demographic profile of the study group

Variable	Categories	% (count)*
Marital status	Married	86.7 (26)
	Unmarried	13.3 (4)
Education	Illiterate	26.7 (8)
	Primary school	43.3 (13)
	High school and above	30 (9)
Socio-economic status	Upper	70 (21)
	Upper middle	13.3 (4)
	Middle	13.3 (4)
	Lower middle	3.3 (1)
Family type	Nuclear	43.3 (13)
	Joint	56.7 (17)
Living in village since	$\leq$ 20 years	10 (3)
	>20 years	90 (27)

Note: *N = 30

Table 2 displays the lifestyle characteristics of the studied population. In this 46.7% of the participants believed their health to be normal where 80% had physical activity of less than 3 per week. Majority of the participants (76.7%) skip their breakfast and have just 2 meals throughout the day. Tobacco consumption was reported by 23.3%, daily caffeine intake of less than 2 cups by 76.7% and water intake of more than 2 litres daily by 60% of the women participants.

TABLE 2

Lifestyle characteristics of the study group

Variable	Categories	% (count)*
Self-perceived health	Excellent	20 (6)
	Good	46.7 (14)
	Poor	33.3 (10)
Physical activity	< 3 weeks	80 (24)
	≥3 weeks	20 (6)
Intake of breakfast	Regular	23.3 (7)
	Irregular or nil	76.7 (23)
Frequency of daily meals	>2 meals	23.3 (7)
	≤ 2 meals	76.7 (23)
Daily water intake	>2 litres	60 (18)
	< 2 litres	40 (12)
Tobacco consumption	Yes	23.3 (7)
	No	76.7 (23)
Daily caffeine intake	>2 cups	26.7 (8)
	≤ 2 cups	73.3 (22)

Note: *N = 30

The reproductive profile of the study group is displayed in Table 3. Mean age at menarche and menopause is 14.8 ± 1.126 years and 43 ± 6.238 years respectively. Mean age for marriage of this population is 16.83 ± 2. 036 years. The mean gravidity (total number of times a woman has conceived) and parity (number of live births given by a woman) is 4.6 ± 2.143 and 3.73 ± 1.311 children respectively. Majority of the women (83.5%) belong to post-menopausal phase out of which only 68% had natural menopause. Mean age at first conception for these women was 19.6 ± 1.6 years whereby majority, 70% of the women got pregnant before the age of 20 years.

TABLE 3

Reproductive characteristics of the study group

Variable	Mean ± SD (N = 30)
Age at marriage	16.83 ± 2. 036
Age at menarche	14.8 ± 1.126
Age at FMP*	43 ± 6.238
Gravidity	4.6 ± 2.143
Parity	3.73 ± 1.311
Menopausal status	
Pre-menopausal Post menopausal	16.5 (5)83.3 (25)
Age at first conception	19.6 ± 1.6
≤ 20 years >20 years	70 (21)30 (9)
Type of menopause*	
Natural Surgical	68 (17)32 (8)
Miscarriages	
≤ 2 >2	86.7 (26)13.3 (4)

Note: *FMP- Final Menstrual Period; N = 25 *(Continuous variables are expressed as Mean ± SD and categorical variables are represented as % (count))*

It can be seen from Table 4 that a greater number of people who perceive their health to be good have no/ mild symptoms (20.7%) whereas for majority symptom severity is moderate/severe who perceive their health to be poor (31%). Overall, greater number of participants have moderate or severe menopausal symptoms whose frequency of physical activity is more than 3 per week. More number of individuals (48.3%) who skip breakfast have moderate to severe symptom severity compared to those whose breakfast intake is regular and experiencing nil to mild symptoms of menopause (10.3%). More number of women who consume less than two cups of caffeine per day experience almost no or mild symptoms. All women who consume tobacco in any form belong to the category of experiencing moderate or severe menopausal symptoms, whereas equal proportion of women not consuming tobacco in any form belong to both the groups. A greater proportion of women (31%) drinking less than 2 litres of water daily experience moderate to severe symptoms. There is significant difference in both the groups of menopausal symptom severity for self-perceived health, caffeine intake and tobacco consumption.

TABLE 4

Crosstab and chi-square distribution of menopausal symptom severity (MRS score) and lifestyle characteristics

Variable	Categories	No / mild symptoms#	Moderate/ severe symptoms#	χ^2	p-value
Self-perceived health	Excellent	13.8 (4)	3.4 (1)	7.27	.027*
	Good	20.7 (6)	27.6 (8)		
	Poor	3.4 (1)	31 (9)		
Physical activity	>3 weeks	27.6 (8)	51.7 (15)	0.468	.494
	< 3 weeks	10.3 (3)	10.3 (3)		
Breakfast intake	Regular	10.3 (3)	13.8 (4)	0.095	.758
	Nil/ irregular	27.6 (8)	48.3 (14)		
Caffeine intake	< 2	20.7 (6)	17.2 (16)	4.398	.036*
	>2	55.2 (5)	6.9 (2)		
Tobacco consumption	Yes	0	24.1 (7)	5.639	.018*
	No	37.9 (11)	37.9 (11)		
Daily water intake	< 2 litres	6.9 (2)	31 (9)	2.936	.087
	>2 litres	31 (9)	31 (9)		

Note: *Significant at p-value < .05*, < .01**, < .001****

 # menopausal symptom severity expressed as % (count)

Table 5 displays correlation of cognitive status as per MoCA score with reproductive health, lifestyle and socio-demographic variables. In reproductive factors age at menarche and age at marriage show weak positive correlation with cognitive status and gravidity, age at 1st conception and parity showed weak negative correlation with cognitive status. However, age at FMP and number of miscarriages showed moderate negative significant correlation with cognitive status. Within lifestyle variables, daily caffeine intake, daily water intake, meals frequency and self-perceived health showed weak positive correlation, on the other hand breakfast intake and physical activity level showed weak negative correlation with cognitive status. Tobacco consumption showed moderate positive correlation with significant values. Socio demographic variables like age and education showed significant correlation of moderate negative and positive values respectively with cognitive status. Whereas marital status (positive) and family type (negative) showed weak correlations with cognitive status with no significant results. Socio-economic class of the participants was weakly correlated with the cognitive status with no significant values.

Correlation of various menopausal symptoms with significant values within the menopausal rating scale is shown in Table 6. It can be seen that depression has strong positive correlation with irritability and anxiety whereas only moderate positive correlation with physical exhaustion. Heart discomfort correlates strongly and positively with hot flushes, sleep problems and bladder problems. Irritability and anxiety have a moderately positive correlation with physical exhaustion, while vaginal dryness has a moderately positive correlation with bladder issues.

TABLE 5

Correlation of cognitive status (MoCA score) with reproductive health, lifestyle and socio-demographic factors

Variable	r	p-value
Reproductive factors		
Age at menarche	.16	.935
Age at FMP	-.541	.006**
Age at marriage	.111	.565
Gravidity	-.364	.052
Age at 1st conception	-.104	.593
Parity	-.246	.198
Miscarriages	-.387	.038*
Lifestyle factors		
Daily caffeine intake	.068	.727
Tobacco consumption	.367	.050*
Daily water intake	.290	.127
Daily meals frequency	.232	.226
Breakfast intake	-.232	.226
Self-perceived health	.020	.916
Physical activity	-.053	.783
Socio-demographic factors		
Age	-.403	.030*
Education	.597	.001***
Socio-economic Status	-.228	.235
Marital status	.096	.620
Family type	-.172	.372

Significant at p-value < .05, < .01**, < .001****

TABLE 6

Correlation of menopausal symptoms within the menopausal rating scale

1st Symptom	2nd Symptom	r	p-value
Heart discomfort	Hot flushes	.532	.003**
Heart discomfort	Sleep problems	.383	.041*
Heart discomfort	Bladder problems	.483	.008**
Sleep problems	Blood pressure	.398	.032*
Depression	Irritability	1.00	.00***
Depression	Anxiety	.932	.00***
Depression	Physical exhaustion	.442	.016**
Irritability	Physical exhaustion	.442	.016**
Anxiety	Physical exhaustion	.369	.049*
Bladder problems	Vaginal dryness	.596	.001***

Significant at p-value < .05, < .01**, < .001****

DISCUSSIONS

It is a population-based study on 30 Rajput women in midlife where a greater number of people who perceive their health to be good have no/ mild symptoms of menopause (20.7%) whereas for majority symptom severity is moderate/severe who perceive their health to be poor (31%). The similar association between climacteric symptoms and negative self-rated health was verified in a study on 760 Brazilian women. It has been shown that climacteric symptoms are associated with a negative self-perception of health; it is possible that this association is due to the negative effect that the symptoms have on the psychological state of women, and vice versa (Silva *et al*., 2018). In our study, 20.7% women who consume less than two cups of caffeine (tea/coffee) per day experience almost no or mild symptoms. Faubian S.S. reported associations between caffeine intake and vasomotor symptoms bother in post-menopausal women (Faubion *et al*., 2015). However, in our study it was also found that majority of women (55.2%) who consumed more than 2 cups of caffeine daily reported mild or no symptoms of menopause. Pimenta *et al*., 2011 hypothesised that the neurocognitive benefits of caffeine may have contributed to a reduction in vasomotor symptoms, or that elevated levels of estrone, which have been linked to high caffeine consumption, could explain the observed effect. The present study revealed that age at FMP (Final Menstrual Period) and number of miscarriages showed moderate negative significant correlation with cognitive status (Pimenta *et al*., 2011). This is discordant with several studies which shows that longer reproductive span, i.e., late age at menopause is associated with better cognitive functioning and decreased risk for late age dementia (Yoo *et al*., 2020). However, in support of our findings there are studies showing that cognitive changes that occur late after menopause are associated with aging and not with the last menstrual period. According to previous studies, this cognitive decline during perimenopause appears to normalise during postmenopause (El Khoudary *et al*., 2019). If this pattern of memory changes during the menopausal transition is correct, it means that a drop in estradiol levels probably isn't the only cause of cognitive changes, since memory seems to get better even as estradiol levels stay low. According to our findings, a moderately positive correlation exists between tobacco use and cognitive status with significant values. In support of these findings molecular studies showed that nicotine administration can improve cognitive impairment in Alzheimer's disease (AD), and dyskinesia and memory impairment in Parkinson's disease (PD) through various bio-genetic mechanism (Alhowail, 2021). Socio demographic variables like age and education showed significant correlation of moderate negative and positive values respectively with cognitive status and these findings have been concordant with several studies highlighting the importance of education in improving the cognitive functioning of an individual (Gong and Wu, 2021; Hogervorst *et al*., 2022).

CONCLUSION

The current study revealed that women's menopausal symptoms vary according to their lifestyle choices, with significant differences in symptom severity due to self-perceptions of health, caffeine consumption, and tobacco use. Cognitive status of the studied population was related to caffeine consumption, age at first menstrual period, and number of incomplete pregnancies (miscarriages). Age and education were also discovered to have significant correlations with cognitive status. Conclusively, other than biological factors that determine the menopausal transition, lifestyle, reproductive, and socio-demographic factors influence the health of women during this phase as manifested through menopausal symptoms.

Additionally, the study has few limitations. The

sample size is small and therefore insufficient for making broad generalisations. The majority of reproductive factor data (age at menarche, age at marriage, age at first menstrual period, number of miscarriages, abortions, hysterectomies, etc.) was derived from the retrospective memories of older women, which may contain biases in memory recall. Menopausal symptoms were self-reported by the women, and may vary with the actual biological symptoms present. Despite this, the results presented in this pilot study of a homogenous population were significant and may be useful for future research expansion.

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