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Health and Nutritional Status of Postmenopausal Women Living in Rural Area of Tamil Nadu

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Abstract

The health of postmenopausal women especially living in rural areas is neglected. A cross sectional study was conducted among 45 to 70 years old postmenopausal women living in Barugur Taluk of Tamil Nadu, India, using a pretested, structured questionnaire with an objective of identifying the postmenopausal women with poor health and nutritional status. Majority of the selected women were 45 to 50 years old (40%) and illiterates (87.45%). More than 60 percent of them had ≥ 3 children. More than 90 percent were non vegetarians and 80.39 percent of them were taking tea. Nearly 25 percent of them were overweight or obese and only 35.29 percent had normal Hemoglobin. TBF (%) and VF (%) were above normal for 20.83 percent and 18.18 percent of the selected women respectively. The W/H ratio of 65.28 percent showed central obesity. The blood pressure and blood sugar level was high for 11.8 percent and 19.44 percent of the women respectively. The nutritional and health status of the selected postmenopausal women were poor. Special health camps can be conducted in rural areas to identify the women who are at risk of malnutrition and at risk of developing MS.

Keywords: Body Composition, Metabolic Disorders, Nutritional Status, Postmenopausal Women

1. Introduction

In our health system, women of reproductive age group are given more importance. The postmenopausal women living in urban as well as rural area are neglected[1]. The population of these women increases with an increase in life expectancy along with an increase in health problems. Menopause changes the life style of women in various ways and impacts physical, emotional, social and financial quality of life[2]. Vaz *et al.* (2011)[3] revealed that "negative attitude towards menopause is seen more in rural women than in their urban counterparts. Postmenopausal women with higher gravidity had higher levels of oxidative stress biomarkers than women with lower gravidity. This oxidative stress is implicated to play central role in the patho-physiology of many diseases associated with higher mortality in post reproductive life such as cardio vascular diseases, certain forms of cancer, insulin resistance, diabetes and Alzheimer's disease". Rural population is primarily in need of public health care in the postmenopausal period[4]. Hence, the present study was conducted with the objective of assessing the nutritional status of postmenopausal women and to trace out postmenopausal women who were at risk of developing metabolic diseases in Barugurtaluk of Krishnagiri district in Tamil Nadu.

2. Methodology

For this cross sectional survey, postmenopausal women who were 45 to 70 years old living in Barugur taluk were selected based on the inclusion criteria that they should have attained menopause naturally, should not have

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chronic diseases with complications, mentally sound enough to respond and willing to participate in the study. By using single population proportion formula, sample size was obtained as 255 and samples were selected by purposive sampling method. A pretested, semi structured questionnaire was used to collect data on general information, family details and reproductive history from the selected postmenopausal women by face to face interview method. Nutritional status (BMI, Hemoglobin and MNA) and presence of risk factors for the development of metabolic syndrome (Waist/Hip ratio, Blood pressure, and Blood sugar and Body composition) were assessed using standard methods.

3. Results and Discussion

3.1 General Information, Socioeconomic Status and Family Details of Postmenopausal Women

Ganapathy and Al Furaikh (2018)[5] identified "socioeconomic status as one of the detrimental factors that could invariably influence the women's menopausal age". General information, socio economic status and details about the family of the selected postmenopausal women is depicted in Table 1.

This shows that 40 percent of the selected postmenopausal women were 45-50 years old and another 24.32 percent were 56-60 years old. "Their mean age at marriage was 14.66 ± 2.49 years and mean age at menopause was 46.72 ± 2.12 years which matched with the natural menopausal age (46.2 ± 4.9 years) of Indian women" indicated by Ahuja (2016)[6]. More than 85 percent of the women were illiterates. Almost all of them were Hindus (98.43%). Though very few were employed outside or self-employed, nearly 80 percent of them were daily wage earners and 97 percent of them belonged to very low economic status according to Prasad's socio economic classification. Mean age at menopause observed by Ranasinghe *et al.*, (2017)[7] was 49.9 years which was more than the result obtained in this study. According to Mahajan *et al.*, (2012)[8], in North India, age at menopause

Table 1. General Information, Socioeconomic Status and Family Details of Postmenopausal Women (N=255)

Sl. No.	Variables	Number	Percentage
1.	**Present age (years)**		
	45 – 50	102	40.00
	51 – 55	43	16.86
	56 – 60	62	24.32
	61 – 65	24	9.41
	66 – 70	24	9.41
2.	**Education completed**		
	Illiterate	223	87.45
	Primary	14	5.49
	Secondary	16	6.28
	Higher Secondary	2	0.78
3.	**Marital status**		
	Married	145	56.86
	Widow	110	43.14
4.	**Type of family**		
	Nuclear	43	16.86
	Joint	212	83.14
5.	**Number of children**		
	1 – 2	84	32.94
	3 – 4	126	49.42
	5 – 6	39	15.29
	7 – 8	6	2.35

was 44.54 years which was less than our result. A cross-sectional study by Poomalar and Arounassalame (2013)[9] in South India reported that women who belonged to the lower-income group reached menopause at 43.3 years which was in contradiction to our study. Ramteke *et al.*, (2016)[10] found more postmenopausal women had completed till higher secondary school (35%) and only 14 percent were illiterate but our study showed 87.45 percent as illiterates.

The marital status of the selected woman indicated that 56.86 percent were currently married and 43.14 percent were widowed. Among these women, 83.14 percent were found to live in joint family with 5.43±1.69 average number of family members. Nearly half of them (49.42%) had 3-4 children. Another 17.6 percent of them had 5-8 children. Ramteke *et al.*, (2016)[10] also indicated that 78 percent of the studied subjects were married, 21 percent were widowed and 1 woman was divorcee. Senthilvel *et al.*, (2018)[11] too observed same percentage of married women (77.3%) and widows (21.3%) among the postmenopausal women selected for the study. Samtani *et al.*, (2020)[12] showed that more percentage of women (60.2%) having only up to 1-3 children and only 39.3 percent of them had more than 3 children in contrary to our study where only 32.94 percent of the women had 1-2 children and 67.02 percent had 3 or more children.

3.2 Food Habit and Nutritional Status of Postmenopausal Women

3.2.1 Food Habit

Table 2 highlights the food habit of the selected women. About 94 percent were taking non vegetarian diet which is entirely different from the study conducted by Samtani *et al.*, (2020)[12] where 94.4 percent of the women were taking vegetarian diet but similar to Tiwari *et al.*, (2020)[13] who found that majority were taking non-vegetarian diet. Around 79 percent of the postmenopausal women were taking 3 meals per day and 20.14 percent were having only two meals in a day. Tiwari *et al.*, (2020)[13] reported consumption of three meals by 64 percent and only 13 percent consumed meal two times in a day which was similar to our study. Tea was consumed by 80.39 percent and 36.86 percent of them reported to be chewing betel leaves. Dasgupta *et al.*, (2012)[14] also stated significantly higher number of tribal participants was tobacco chewers and majority of participants consumed black tea.

3.2.2 Nutritional Status

Table 3 shows the nutritional status of the postmenopausal women. The nutritional status of the postmenopausal women was assessed using BMI, Hb level and MNA score. The mean BMI (22.78 ± 4.16) was within the normal range. Similar to Naik and Nirgude (2020)[15], about 10 percent of them were undernourished. Nearly 65 percent of the women had normal BMI and 25 percent showed over nutrition. But Naik and Nirgude (2020)[15], Ranasinghe *et al.* (2017)[7] and Mahajan *et al.* (2012)[8] observed a higher prevalence of over nutrition among the postmenopausal women (51.2%, 42.1% and 39% respectively).

Only 35.29 percent had normal hemoglobin level. Moderate to severe anemia was present in 34.9 percent of them. Slightly negative correlation was obtained between number of children and hemoglobin level of the postmenopausal women.

Table 2. Food habit of post menopausal women

Sl. No.	Variables	Total (n=255)	Percentage
1.	**Dietary pattern** Vegetarian Non vegetarian	 14 241	 5.49 94.51
2.	**Number of meals taken per day** 2 3 4	 29 114 1	 20.14 79.17 0.69
3.	Drink Tea	205	80.39

Table 3. Nutritional status of the post menopausal women

Sl. No.	Variables	Total (N=255)	Percentage
1.	**Mean body mass index**	22.79±4.16	
	Under nutrition	24	9.41
	Normal nutrition	169	66.28
	Over nutrition	62	24.31
2.	**Hemoglobin level**		
	Moderate to severe anemia	89	34.9
	Mild Anemia	76	29.81
	Normal	90	35.29
3.	**Mean MNA Score** (n = 110)	17.99 ± 3.24	
	Under nutrition (<17)	12	10.91
	Risk of malnutrition (17- 24)	78	70.91
	Satisfactory (>24)	20	18.18

The mean MNA score (17.99 ± 3.24) indicated that they were at risk of malnutrition. Based on the MNA score, 10.91 percent were under nourished. Though 66.28 percent had normal BMI, according to MNA score, 70.91 percent were at risk of malnutrition. Our study recorded lower mean MNA score and higher percentage of women at risk of malnutrition compared with the study done by Naik and Nirgude, (2020)[15] whose samples had mean MNA score of 21.759 ± 2.957 and 63.3 percent were at risk of malnutrition.

3.2.3 Body composition

The body composition of the selected women is indicated Table 4. The total body fat (%) was normal for 68.38

Table 4. Body composition of the post menopausal women

Sl. No.	Variables	Total (N=255)	Percentage
1.	**Total body fat (%) (TBF)**		
	Mean	31.45±6.41	
	Very high (≥ 39.0)	43	17.00
	High (33-38.9)	35	13.83
	Normal (21-32.9)	175	68.38
	Low (< 21.0)	2	0.79
2.	**Visceral fat (%) (VF)**		
	Mean	5.36±4.5	
	Very high (15-30)	18	7.11
	High (10-14.5)	28	11.07
	Normal (0.5-9.5)	209	81.82
3.	**Skeletal muscle mass (%) (SMM)**		
	Mean	20.9±9.11	
	Very high (> 35.4)	6	2.35
	High (30.4-35.3)	13	5.1
	Normal (24.3-30.3)	79	30.98
	Low (< 24.3)	157	61.57

percent of the postmenopausal women. It was high and very high for 13.83 percent and 17 percent respectively. But the mean TBF (%) was within the normal range (31.45 ± 6.41). It was observed by Das *et al.*, (2020)[16] that fat mass measures like BF and subcutaneous fat at whole body, trunk, arms and legs were increased with age.

Visceral fat (%) was normal for 81.82 percent and high or very high for 11.07 percent and 7.11 percent respectively. The mean visceral fat (%) was also with in the normal range (5.36 ± 4.5). Jesmin *et al.*, (2013)[17] opined that the change in the pattern of hormone secretion leads to gradual visceral fat accumulation which caused central obesity in postmenopausal women. Dasgupta (2012)[14] added that central obesity in turn independently caused abnormalities in metabolic risk variables.

Only 30.98 percent of the postmenopausal women had normal skeletal muscle mass (%). It was low in 61.57 percent of the women. The mean skeletal muscle mass (%) was also low (20.9 ± 9.11). According to Das *et al.* (2020)[16], skeletal muscles at whole body, trunk, arms and legs were decreased with the advancement of age. These changes in body composition with aging may be due to an imbalance between energy intake and energy needs associated with increasing sedentary lifestyle.

Though statistically not significant, number of children and dietary pattern of the selected women had positive correlation with total body fat (%), visceral fat (%) and lean body mass (%). Skeletal muscle mass had a positive correlation with dietary pattern and negative correlation with number of children. The relationship between menopausal status and changes in body composition may be associated with the hormonal changes in terms of decreased estrogen and progesterone concentrations and increase gonadotrophins, follicle-stimulating and luteinizing hormones[16].

3.2.4 Presence of Risk Factors for the Development of Metabolic Syndrome

Risk factors for the development of MS in the postmenopausal women are depicted in Table 5.

The mean waist circumference was found to be 73.98 ± 8.66 cm. Only 34.72 percent had normal waist to hip ratio and 65.28 percent exhibited central obesity which was further supported by high mean W/H ratio (0.88 ± 0.08cm) where normal value is <0.85cm. This indicated that they were at risk of developing Dasgupta *et al.* (2012)[14] summarizes that sedentary lifestyle, faulty dietary practices which caused increased accumulation of abdominal fat, decreased basal metabolic rate with age and decreased energy expenditure increased waist circumference and WHR among postmenopausal

Table 5. Risk factors for the development of metabolic syndrome

Sl. No.	Variables	Total (n=145)	Percentage
1.	**Waist** circumference (cm)	73.98±8.66	-
2.	**Waist to hip ratio** Normal (< 0.85) Central Obesity (≥ 0.85) Mean	 50 95 0.88±0.08	 34.72 65.28 -
3.	**Diastolic blood pressure (mmHg)** Normal (< 85) High (≥ 85)	 127 17	 88.20 11.80
4.	**Systolic blood pressure (mmHg)** Normal (< 130) High (≥ 130)	 129 16	 88.88 11.12
5.	**Blood Sugar (mg/dl)** Normal (< 120) High (≥ 120)	 117 28	 80.56 19.44

women in Mysore, Karnataka. It was also documented that menopausal status and related central obesity was the major predictor for metabolic risks in menopausal women of Karnataka, South India. WHR was negatively correlated with number of children and positively correlated with the dietary pattern of the women. But the correlation obtained was not statistically significant.

In our study, the diastolic blood pressure and systolic blood pressure of 88 percent and blood sugar level of 80 percent of the postmenopausal women were normal showing that nearly 20 percent of them were at risk of developing MS. But the mean value of diastolic blood pressure, systolic blood pressure and blood sugar was 75 mmHg, 118 mmHg and 112 mg/dl respectively which were within the normal values. Mahajan *et al.*, (2012)[8] showed higher prevalence of hypertension (23%) and lower rate of diabetes (6%) among post-menopausal women. Thirty nine percent of women were found having their BMI higher than the normal range which was more than our study and demonstrated a statistically significant ($P < 0.05$) relationship between BMI and hypertension. Negligible cases of cardiovascular diseases in the women studied by Samtani *et al.* (2020)[12] further support that late age at menopause (47.97±3.4 years) along with other socio demographic factors, were protecting women from cardiovascular diseases. High visceral fat of the postmenopausal women in our study obtained a statistically significant relationship ($P<0.05$) with hypertension and high blood sugar.

4. Summary and Conclusion

The health and nutritional status of the selected postmenopausal women showed that though the BMI of 66.28 percent was normal, nearly ¼ of the women were overweight or obese. More than 65 percent of them had mild to severe anemia and more than 80 percent were malnourished or at risk of malnutrition based on the MNA score. TBF (%) and VF (%) were high to very high in 30.83 percent and 18.18 percent of them respectively and SMM (%) was low in 61.57 percent of the women. Though the presence of all the three selected risk factors was found only in negligible percentage of the women, central obesity was present in 65.28 percent, high systolic and diastolic blood pressure was seen in 11 percent and high blood sugar was seen in 19.44 percent of the postmenopausal women. This indicated that the risk of developing MS was increasing in rural postmenopausal women.

5. Recommendation

A very strong need for increased public health care system to postmenopausal women in rural areas is emphasized for their healthy post reproductive life.

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