



Anthropometric Profile and Menopausal Age of 40 to 80 Year Old Women of Punjab: A Study

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ABSTRACT The present cross-sectional study was designed to assess the physical growth of Pre-menopausal and Post-menopausal women of Patiala and Chandigarh along with their menopausal age. The data collection was done during the period of mid January to April 2010. The study included 318 women (86 pre-menopausal and 232 post-menopausal) in the age range of 40 to 80 years. All the subjects were permanent residents of the Punjab and belonged to urban area of Patiala and Chandigarh. The height, weight, four circumferences (upper arm, thigh, waist and hip), were taken to define the anthropometric profile of aging women. All these Anthropometric measurements were taken on each subject by the first investigator. The results showed that height, weight, upper arm and thigh circumferences had higher values in Post-menopausal women than their counterparts. The median age of menopause of the subjects of the present studied population was 43.5 ± 4.5 years.

INTRODUCTION

The word “menopause” literally means the “end of monthly cycles”. It has been used to the end of fertility is traditionally indicated by the permanent stopping describe this change in human females, where of monthly menstruation or menses (Walker and Herndon 2008). The date of menopause in human females is medically defined as the time of the last menstrual period in those women who have not had a hysterectomy. Women who have had their uterus removed but retain their ovaries do not immediately go into menopause, even though their periods cease.

The Study of Women Health Across the Nation (SWAN) showed a gain of 2.1 kg in weight (3% increase) and a mean increase of 2.2 cm in waist circumference (2.8% increase) over a 3 year follow up. This gain could be attributed to age and physical activity level. Other studies suggested that women experience a 0.68 kg per year increase in weight during 40s and 50s, regardless of their menopausal status (Wing et al. 1991; Macdonald et al. 2003). NHANES (National Health and Nutrition Examination Survey) showed that waist circumference increases with

age, and is greater in older than younger females (Ford et al. 2003).

In the Western world, the most typical age range for menopause is between the ages of 40 and 61 years (Minkin 1997). In India and in Philippines, the median age of natural menopause is considerably earlier, at 44 years (Ringa 2000). Menopause occurs at approximately 50 years of age and usually ranges between 45 and 54 years in healthy, well-nourished females worldwide (Treloar 1981; Gosden 1987; Gosden and Faddy 1995). The median age at menopause in Europe ranges from 50.1 to 52.8 years, in North America from 43.8 to 53 years, in Latin America from 43.8 years to 53 years, and in Asia from 42.1 to 49.5 years (Palacios et al. 2010).

Previous reports indicate that women in developing countries like Indonesia, Pakistan, Chile, Peru and India experience menopause earlier than those in developed countries (Wasti et al. 1993; Kato et al. 1998; Yahya and Rehan 2002; Talwar and Pande 2004). Age at menopause varies substantially even between the Asian women. Age at menopause is lower than reported among women of Thai (49.30 years, Kono et al. 1990), Malaysia (50.70 years, Ismael 1994), (51.3 years, Rehman et al. 2010) Turkey (51.00 years, Neslihan et al. 1998) and Pakistan (50.00 years, Yahya and Rehan 2002).

There is lack of literature on anthropometric status of pre-menopausal and post-menopausal women of Punjab. Thus, the present paper provides more information on growth of aged females and their menopausal age.

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Objectives

The aim of the present study was to evaluate the Physical growth of 40 to 80 year old women of Punjab and to assess, the median age of menopause in Punjabi women.

further five age groups were made for the data analysis. The frequency for menopause was calculated and the menopausal age was assessed by probit analysis (Finney 1952). The t-test was applied for the comparison between the two groups.

METHODOLOGY

The present cross-sectional study was conducted on 318 women (86 Pre-menopausal and 232 Post- menopausal) who were permanently residing in urban areas of Patiala and Chandigarh (Punjab). Data collection was done from mid January to April 2010. All subjects were housewives belonging to upper middle socio-economic status. All the measurements were taken with minimum clothing following the techniques given by Lohman et al. (1988). The measurements which were taken on each subject included height, weight and four circumferences (upper arm, waist, hip and thigh). For menopausal status, women were just asked whether they had experienced menopause or not and were further divided into 2 groups: Pre- menopausal and Post- menopausal (post-menopausal women were those who had experienced menopause at least 3 years back). The decimal age was calculated by subtracting the date of examination from the date of birth (Tanner et al. 1966) and

RESULTS

The weight of post-menopausal women was 70.4 kg at the age range of 40-44.99 years, then it decreases to 65.8 kg at 54.99 years, and further, a gain was noticed following a decrease from 60 years onwards (Table 1). Pre-menopausal women had weight of 60.30 kg which further increased to 67.02 kg. The post-menopausal women had more weight as compared to their pre-menopausal counterparts. The differences between the two groups were statistically significant.

Post-menopausal women had lesser height as compared to the pre-menopausal ones (Table 1). Post-menopausal women were having height of 154.4 cm at 40-44.99 years which decreased to 152.25 cm. Then there was a 2 cm gain in height and further it decreased from 60 year onwards. The groups showed non- significant differences.

Upper arm circumference had larger values in post-menopausal women as compared to pre-menopausal women (Table 2). In post-menopausal, upper arm circumference decreased from

Table 1: Weight (kg) and height (cm) table of pre- and post-menopausal women

	Weight				t-value	Height		t-value
	n	Pre-meno	n	Post-meno		Pre-meno	Post-meno	
40-44.99	61	60.30	17	70.47	2.07*	154.88	154.4	0.32
45-49.99	25	67.02	47	66.37	0.21	151.5	152.25	0.47
50-54.99	-	-	60	65.85	-	-	154.54	-
55-59.99	-	-	46	71.08	-	-	152.43	-
60-79.99	-	-	62	63.14	-	-	152.63	-

*indicates level of significance at p <0.05 level

Table 2: Upper arm, waist, hip and thigh circumference of pre- and post- menopausal women

Age	Upper arm circumference			Waist circumference			Hip circumference			Thigh circumference		
	Pre-meno	Post-meno	t-value	Pre-meno	Post-meno	t-value	Pre-meno	Post-meno	t-value	Pre-meno	Post-meno	t-value
40-44.99	27.9	28.79	0.80	84.76	86.7	-0.72	101.1	102.68	0.77	45.54	51.26	3.6*
45-49.99	28.02	28.63	0.58	86.53	89.37	0.86	101.96	104.32	0.91	46.01	47.34	0.80
50-54.99	-	27.64	-	-	88.85	-	-	101.75	-	-	44.17	-
55-59.99	-	28.22	-	-	91.35	-	-	105.7	-	-	45.04	-
60-79.99	-	27.29	-	-	89.95	-	-	100.68	-	-	42.28	-

*indicates level of significance at p <0.05 level

28.79 cm at 40- 44.99 years to 27.64 cm at 45- 50 years. It again increased at 55-59.99 years and further decreased to 27.29 cm. While in pre-menopausal women its value increased with age.

In post-menopausal women, waist circumference increased from 84.76 to 91.35 cm during 40-60 years and then it started decreasing from 60 years onwards (Table 2). In pre-menopausal ones, it was 84.76 cm at 40-44.99 years and increased to 86.53 cm at 45-49.99 years.

Hip circumference increased from 102.68 cm to 104.32 cm during 40-50 years in post-menopausal women, then increased and further, decreased to 100.68 cm 60 year onwards (Table 2). In pre-menopausal women value of hip circumference is 101.1 cm at 40-44.99 years and increased to 101.96 in next age group.

Thigh circumference was 45.54 cm at 40-44.99 years, then decreased, again increased to 45.04 cm at 55-59.99 years and further decreased thereafter (Table 2). The pre-menopausal women showed the trend of increase with advancing age. The post-menopausal women had greater thigh circumference than their counter parts with statistically significant differences. The differences between the circumferences (except Weight and thigh circumference) of the studied groups were largely non-significant. The study reported that menopausal age in the present population was 43.5 ± 4.5 years.

DISCUSSION

The present study describes that post-menopausal women were having more weight than pre-menopausal ones. But it started decreasing with age. Lindquit (1982) observed during 6 year follow-up that post-menopausal women started gaining weight after attaining menopause. Sidhu and Sidhu (1987) observed weight gain till 50 years and after that there was decrease in weight with a net loss of 5.01 kg and 6.09 kg respectively during the entire period studied in Sikh and Hindu Harijan females of Punjab. Kaur (2007) reported that urban Brahmin females were taller and heavier than their rural counterparts at all age groups except for 40-45 years and 46-50 years, where rural females were found to be heavier than the urban females. Some cross-sectional studies (den Tonkelaar et al. 1990; Pasquali et al. 1994) have found post-menopausal women to be heavier than pre-menopausal ones. Cross-sectional study by Donato et al. (2006)

reported that pre-menopausal were taller and thinner. Sternfeld (2004) observed an increase of 2.1 kg or 3% in weight and 2.2 cm or 2.8 % in waist during the 3 year follow-up study. Many studies have investigated that woman in their forties and early fifties were expected to gain weight, approximately 1.5 pounds (0.7 kg) (Williamson et al. 1990; Schmitz et al. 2000; MacDonald et al. 2003). The results of the present investigation are in conformity with the earlier studies.

Similar differences in growth pattern were observed in upper arm, hip and thigh circumferences in the two groups at all age levels. But the growth patterns of waist circumference in both the groups were parallel, with almost similar differences, throughout the aging process. Hartz et al. (1984) evaluated all the circumferences, height and weight measurements in 21,065 women aged 40- 59 years and 11,791 women aged 20-39 years and concluded that more fat around waist is strongly correlated with disease risk as compared to the body fat.

The menopausal age of the studied population group was 43.5 years. Other studies have shown differences in menopausal age of different populations. In Ediga populations of Andhra Pradesh it was reported to be 43.94 years (Bhasker et al. 1986), in Chakli Population it was reported to be 44.45 years (Babu and Naidu 1989), in working women age of menopause reported to be lesser than non working women according to Sethi et al (1996), it was 46.86 and 49.61 years respectively, in Lohar Ghadiyas it was 46.34 years (Yadav et al. 2002). In Bazigar population of Punjab it was 46.98 years (Sidhu 2003), in rural north India menopausal age was 44.10 years (Singh and Arora 2005), in Chandigarh it was 46.74 in rural area and 46.91 in urban area (Puri et al. 2005). In educated women of Amritsar the median age of menopause was 47.54 ± 2.31 years (Sidhu et al. 2005), in rural Brahmin females was 48.22 ± 2.47 years and in urban females it was 49.30 ± 2.80 years (Kaur and Talwar 2009). Age of menopause was reported to be 47.65 ± 3.77 and $48.2.85$ in working and non-working women respectively (Pathak and Prashar 2010), in middle age women of Kushtia (Bangladesh) it was 51.14 years (Rehman 2011). In working Punjabi women of Jalandhar mean and median age of menopause was reported to be 46.55 ± 4.50 and 46.06 ± 4.85 years respectively, in Karnataka it was 45.00 ± 9.12 years (Rokhade et

al. 2013), in Urban Vadodadra women it was 45.45 ± 4.8 years (Gaur and Iyer 2013). In Hindu women of west Bengal it was 51.09 ± 3.78 years (Dasgupta and Subha 2013). In rural Maharashtra it was observed 48.90 ± 3.2 years (Pal et al. 2013), in rural area of Amritsar mean/median age of menopause was noticed to be $48.86 \pm 2.12/49.95 \pm 3.12$ years (Randhawa and Sidhu 2014). As compared to earlier studies, the present study showed lowest age for menopause.

CONCLUSION

The values for all the anthropometric measurements were more in post menopausal women but their values started decreasing with age. Menopausal women attributed the weight gain to hormonal changes that occur during menopause or during mid-life transition. Change in life style, reduced physical activity, diet and physiology of the individual could also be responsible for weight gain or having greater values for height, weight and circumferences.

RECOMMENDATIONS

The women who are going through the period of menopause must have knowledge about the menopausal symptoms. Most of the women who experience menopause also face many body changes. There could be weight gain and increase in body circumferences in women going through it. It is recommended that they should include exercise, dietary and lifestyle modifications are to manage menopausal period in healthy way.

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