

## MENOPAUSE ASSOCIATED HYPERTENSION AND ITS RELATION TO ANTHROPOMETRIC PARAMETERS IN WOMEN OF NAWABSHAH (SBA) SINDH

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### **ABSTRACT:**

High blood pressure had recognized as a most important reason of morbidity and mortality in mutually advanced and undeveloped countries. The females at postmenopause remain on high risk of cardiovascular problems globally, and this problem increases by the ageing. 600 contestants existed in our research were separated into 3 groups. Participants were enlisted according to the conditions of designed proforma. All participants provided stated and written contract after being informed about the study's purpose. Anthropometric parameters of all the participants were taken. The descriptive statistics presented as mean and standard deviation through using the ANOVA test. The mean values of weight, waist circumference, hip circumference, waist hip ratio, systolic blood pressure and diastolic blood pressure were raised in postmenopausal females in comparison to premenopausal and normal healthy females with significant difference of ( $p < 0.001$ ). The mean values of BMI and mid upper arm circumference (MUAC) of postmenopausal participants were slightly raised in comparison with control group and premenopausal participants ( $p < 0.05$ ). We determined in this research that females later menopause were at greater probability of high blood pressure and other related diseases. The existing study is intellectualized to observe numerous bio-social prognosticators of blood pressure rise and their likely influence toward increased blood pressure in females.

**Key words:** Hypertension, premenopause, postmenopause

### **INTRODUCTION:**

In both industrialized and underdeveloped countries, rise in blood pressure had recognized as a leading reason of morbidity and mortality.<sup>1</sup> The bulk of cardiovascular disease (CVD) in the globe is caused solely by hypertension. The over-all problem of hypertension, a possibility

reason of many degenerative diseases, is significant.<sup>2</sup> Diabetes, insulin resistance, and cardiovascular disease (CVD) are a few of the chronic non-communicable diseases (NCDs) that have been identified to be specifically associated with obesity. In prior investigations, obesity and hypertension were linked to negative health effects. Obesity and hypertension are linked to a number of health problems, making it harder to provide effective primary care in the twenty-first century.<sup>3</sup> Over 25% of adult females worldwide have high blood pressure. Globally, postmenopausal women are more likely to experience cardiovascular issues, and their risk rises with age.<sup>4</sup> The prevalence of increased blood pressure, stress, dyslipidemia, obesity, diabetes mellitus, decreased glucose tolerance, vascular inflammation, fluctuations in the pattern of fat distribution, and other conditions have all been linked to such risks. Due to the reduction of estrogen synthesis after menopause, blood pressure rises, which contributes the greater occurrence of rise in blood pressure in aged females.<sup>5</sup> The first ten years following menopause are characterized by the rise in blood pressure. Women were more likely than males to have hypertension during their seventh decade of life. Cardiovascular problems caused by hypertension were more common in females at the time of menopause than men with same age, and these complications were identified as the major reason for death in females.<sup>6,7</sup> Credentials of potential possibility factors and postmenopausal women's prevention of hypertension are crucial given the ageing of the global population.<sup>8</sup> Blood pressure elevations in women have been related to the greater possibility of CVD, and hypertension is more common in women over 60.<sup>9</sup> Adult CVD has been on the rise in recent decades, and this tendency may continue. To prevent an increase in the burden of hypertension and associated CVDs among women, it is important to pay attention to the relationship between hypertension and the menopause and associated risk factors. It is becoming more and more crucial to have knowledge about high blood pressure and its causes in order to improve current medical services.<sup>10</sup>

#### **MATERIAL AND METHODS:**

This study was done at the Department of Biochemistry Peoples University of Medical Health Sciences for Women Nawabshah Shaheed Benazirabad (PUMHSW) along the cooperation with Gynecology and Obstetrics and Medicine OPD/Ward PMCH. The analysis of sample had been done at diagnostic and research laboratory PUMHSW, Shaheed Benazirabad (SBA).

**STUDY DESIGN:** Comparative cross sectional.

**SAMPLE TECHNIQUE:** Non probability convenience random sample selection.

#### **INCLUSION CRITERIA:**

- Normal healthy women between ages of 20 to 35 years.
- Premenopausal and postmenopausal women between ages among 40 years to 60 years.
- Premenopausal and postmenopausal females with hypertension.

#### **EXCLUSION CRITERIA:**

- All the females below 20 years and above age 60 years.
- Patients with existing endocrinal disorders, renal disorder, liver disorder, cardiac disease, hysterectomy and oophorectomy.

- Those who are on treatment.

**SAMPLE SIZE:**

Sample size had been designed by means of the Rao software with prevalence of 15.74% premenopausal women and 59.06% postmenopausal women by means of the percentage in 95% of confidential intervals then 5% of margins of errors, the sample size of premenopause stood to be  $n=204$  and postmenopause  $n=372$ . Where  $n_1+n_2=576$ . Total 600 participants had been included in present study, divided in to group A, B and C.

**GROUP A:** Comprises of 200 normal healthy women as control group between age group of 20 to 35 years.

**GROUP B:** Comprises of 200 premenopausal hypertensive women between age group of 36 years to 50 years.

**GROUP C:** Comprises of 200 postmenopausal hypertensive women between age group of 50 years to 60 years.

Subjects were recruited according to the criteria of designed proforma from Department of Obstetrics and Gynecology and Medicine OPDs PMCH Nawabshah. For this study, We collected complete medical data and pertinent information from every women through filling out a proforma. All participants gave verbal and written agreement after being informed about the study's purpose.

**ANTHROPOMETRIC PARAMETERS:**

Neck, waist circumference, and hip ratio were restrained by means of a bendable but non-stretchable plastic calculating tape. The height was measured on a scale in centimeters (CM), while the weight was measured on a weighing machine. The circumference was measured transient the superior margins of the seventh cervical vertebrae then the inferior margins of the laryngeal prominence that remain on the contracted neck levels, to the nearest 1 mm. The WHO recommends a neck circumference of 34 cm for females. In a horizontal plane, the waist circumference (WC) stayed restrained midway among the inferior border of the ribs and the iliac crest. The hip circumference (HC) was measured over the greater trochanters at its broadest point. A formula was used to compute the waist to hip ratio (WHR). According to the WHO, a typical waist circumference for women is 80 cm, a normal hip circumference is 94.35 cm, and a normal WHR is 0.85 cm.

**ETHICAL CONSIDERATION:** This study had been accompanied firmly upon the ethical instructions later the agreement from Ethical Review Committee of PUMHSW Nawabshah.

**STATISTICAL ANALYSIS PROCEDURE**

For the data analyzes SPSS Version 22.0 was used. ANOVA test applied for comparison among the study groups. Results were shown as mean and standard deviation.

**RESULTS:** The means  $\pm$  standard deviations (SD) of age, weight, BMI, height, neck circumference, waist circumference, hip circumference, waist/hip ratio, systolic BP, diastolic BP,

and mid upper arm circumference (MUAC) of study participants were noted in Table-4.2. The mean  $\pm$ SD of age of the group A was  $28.60 \pm 4.97$  years as matched to the group B and C was  $44.44 \pm 2.61$  and  $54.78 \pm 2.80$  years with the significant p-value  $< 0.001$ .

The mean value of weight of control group was  $53.75 \pm 10.6$  Kg as matched to Group B and C was noted as  $62.16 \pm 11.2$  Kg and  $64.6 \pm 11.6$  Kg respectively with the significant difference of ( $p < 0.001$ ). Then mean values of height of normal healthy females was noted as  $5.10 \pm 11$  Cm as compared to the Group B and C participants was  $5.11 \pm 16$  Cm  $5.08 \pm 16$  Cm whereas presenting the difference of insignificant p value ( $p = 0.057$ ). The mean value of Body mass index (BMI) of control group was noted as  $21.1 \pm 4.2$  Kg/m<sup>2</sup> as matched to the Group B and C was noted as  $24.32 \pm 5.13$  Kg/m<sup>2</sup> and  $26.0 \pm 5.6$  Kg/m<sup>2</sup> where as presenting the difference of significant p value ( $p < 0.05$ ). The mean and SD of neck circumference (NC) of Control group was noted as  $34.3 \pm 1.9$  Cm as compared to Pre and Postmenopausal females was  $35.8 \pm 2.1$  Cm and  $35.7 \pm 2.5$  Cm respectively with insignificant ( $p < 0.58$ ),. The mean and SD of waist circumference (WC) of normal healthy females was  $65.5 \pm 3.9$  Cm as compared to Group B and C was noted as  $72.8 \pm 2.3$  Cm and  $73.1 \pm 2.2$  Cm with very high significant ( $p < 0.001$ ). The mean and SD of hip circumference (HP) of control group was  $97.6 \pm 5.71$  Cm as compared to pre and postmenopausal females was  $101.6 \pm 5.3$  Cm and  $103.2 \pm 3.54$  Cm respectively with significant ( $p < 0.001$ ). The mean value of waist/hip ratio of normal Healthy females was  $0.49 \pm 0.05$  in comparison with the Group B and C participants was  $0.55 \pm 0.03$  and  $0.56 \pm 0.03$  correspondingly with significant p value of ( $p < 0.001$ ). The mean and SD of systolic and diastolic BP of pre and postmenopausal participants was raised as compared to the normal Healthy females. The mean value of systolic BP of control group was noted as  $122.2 \pm 10.7$  mmHg as compared to the group B and C participants was  $134.8 \pm 16.3$  mmHg and  $139.0 \pm 15.4$  mmHg. The mean value of diastolic BP of normal healthy females was  $81.2 \pm 9.3$  mmHg as compared to the premenopausal and postmenopausal women was  $90.2 \pm 11.8$  mmHg and  $92.6 \pm 10.4$  mmHg respectively. The mean values of systolic BP and diastolic BP of study participants showing the very high significance of ( $p < 0.001$ ). The mean and SD of MUAC of control group was noted as  $25.51 \pm 1.65$  as compared to the Group B and C participants was  $27.22 \pm 2.11$  and  $27.40 \pm 2.32$  respectively with significant ( $p < 0.05$ ).

**Table # 1**  
**Anthropometric Constraints of Pre and Postmenopausal Females as matched with Normal Healthy Females**

Variables	Controls Group-A Normal Healthy women (n=200)	Cases Group-B Premenopause females (n=200)	Cases Group-C Postmenopause females (n=200)	p-value
Age (Years)	28.60±4.976	44.44±2.612	54.78±2.809	<0.001
Weight (Kg)	53.75±10.6	62.16±11.2	64.6±11.6	<0.001
Height (Cm)	5.10±.112	5.11±.16	5.08±.16	0.057 NS
BMI (Kg/m <sup>2</sup> )	21.1±4.23	24.32±5.13	26.0±5.6	<0.05
Neck Circumference (Cm)	34.3±1.9	35.8±2.1	35.7±2.5	<0.058 NS
Waist circumference (Cm)	65.5±3.9	73.8±2.3	73.5±3.52	<0.001
Hip circumference (Cm)	97.6±5.71	101.6±5.3	103.2±3.54	<0.001
Waist/Hip ratio	0.49±0.05	0.55±0.03	0.56±0.03	<0.001
Systolic Blood Pressure (mmHg)	120.2±5.7	168.8±26.3	189.5±25.45	<0.001
Diastolic Blood pressure (mmHg)	81.2±9.3	94.2±11.8	95.6±10.4	<0.001
MUAC	29.51±3.61	27.2±2.1	26.40±2.3	<0.05

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001 and NS= Not significant

**DISCUSSION:**

In existing study the mean and SD of age of group A, B and C was  $28.6 \pm 4.97$ ,  $44.44 \pm 2.61$  and  $54.78 \pm 2.8$  years and it is comparable with Sarukasasula A et al study.

Several studies revealed that the anthropometric measurements were altered due to transition of normal healthy females towards menopausal state in their life span. Park KM et al stated that postmenopausal women were overweight as compared to the premenopausal women, similar findings were observed in this study.

Warsi J et al observed the insignificant difference of height in their study participants, the similar findings were observed by present study, the height of the study participants shown insignificant difference. There are more than half a billion adults who are overweight or obese, according to WHO epidemiological figures. According to Shobeiri et al and Ghorbani et al, postmenopausal women had a higher BMI than premenopausal women. In current study weight and BMI of postmenopausal females was greater than the premenopause and control group with substantial difference of ( $p < 0.001$ ). Fat deposition around the neck is a distinct feature of upper body subcutaneous adipose tissue. The neck circumference (NC) has been established as a surrogate metric for evaluating the distribution of upper body subcutaneous fat. It is a low-cost, dependable, noninvasive, repeatable method that is unaffected by respiratory or stomach fullness phases. Previous studies estimated that NC is the biomarker of obesity but present study has shown no any statistically significant difference of NC between the study participants. Some researchers believe that a lack of estrogens is a significant obesity-causing factor. Anthropometric parameters like weight, BMI, waist circumference (WC), hip circumference (HP) and waist-hip ratio (WHR) are considered for obesity evaluation. Fat mass in menopausal women increases and it will change from gynacoid form to android form. Deibert P et al estimated that WC, HC and WHR of the postmenopausal women was greater than the premenopausal women which was consistent with the present study. The current study's postmenopausal ladies had higher systolic and diastolic blood pressure than the premenopausal and control groups. The present study's systolic and diastolic blood pressure results were equivalent to those of Zanchetti A et al.

**CONCLUSION:**

We concluded in this study that women after menopause were at high possibility of hypertension and other comorbidities. The present study is conceptualized to examine various bio-social predictors of hypertension and their possible contribution toward hypertension among women.

**Conflict of interest:** The study has no conflict of interest to declare by any author.

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