

Original article:

A comparative study of blood pressure, BMI and waist hip ratio of pre and post menopausal women

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ABSTRACT

INTRODUCTION - Menopause which means cessation of menstrual activity. After menopause the primordial follicle become atretic and fail completely to produce estrogen. Pre menopause is a term that encompasses the entire reproductive period up to the final menstrual period. There is a combined contribution of obesity, physical inactivity and changed estrogen level which increase the disease risk of menopausal women. The high incidence of ischemic heart disease after menopause suggest close association between ovarian hormone level and cardiovascular system. As age increase in women prevalence of CVD are expected to increase with each decade of life.

AIMS AND OBJECTIVES- To compare the blood pressure, BMI and waist hip ratio of pre and post menopausal women of Gauhati Medical College. To ascertain whether the parameters are significantly altered after menopause

METHOD- A comparative study of 85 pre menopausal women and 115 post menopausal women of the following parameter BMI, Blood pressure, waist hip ratio

STATISTICAL ANALYSIS – Student t test was used to find significant difference in obesity indices and cardiovascular parameter between the two groups.

CONCLUSION- The present study shows that blood pressure, BMI and waist hip ratio is significantly increased in post menopausal women. So with advancing age the risk of cardiovascular disease increase and body fat distribution pattern also change. So measures should be taken to tackle the risk. Factor to decrease the mortality in this group of population

KEY WORDS - Premenopausal, post menopausal, BMI, Blood Pressure

INTRODUCTION-

Menopause is defined as the time at which menstration ceases, whereas climacteric is the phase of waning ovarian activity and may start two or three years before menopause and continue for two to five years[1]. Menopause is associated with and increase in body fat and increase in the relative proportion of abdominal fat[2]. Menopause is burning out of ovaries. After menopause the primordial follicle become atretic hence fails completely to produce estrogen. Pre menopause is a

term that encompasses the entire reproductive period up to final menstrual period[3]. Recent studies suggest the distribution of body fat may be stronger predictor of coronary heart disease than the total amount of body fat[4]. In the Paris Prospective study, men who had an upper body fat distribution were at risk for CHD, independent of body mass index[5]. Similarly in a prospective study conducted in Sweden, the waist to hip ratio was found to be associated with myocardial infarction, stroke in both men and women.[6]. The

effect of upper body fat distribution on atherosclerotic disease may be mediated by the effect on cardiovascular risk factor. waist hip ratio has been associated with increased blood pressure[7]. Increase triglyceride and decreased high density lipoprotein (HDL), Cholesterol. Body fat has also been related to fasting and stimulated levels of glucose and insulin and to increase rates of diabetes[8] There is a combined contribution of obesity ,physical inactivity, and changed estrogen metabolism.

In the disease risk of menopausal women[9.] The high incidence of ischemic heart disease after menopause suggest a close association between hormonal level and cardiovascular system[10].Autonomic control of the heart plays an important role in the cardiac mortality.

The changed sympathovagal activity poses an unfavourable effect on health ,so there is a need to understand the autonomic changes that take place after cessation of estrogen secretion

AIMS AND OBJECTIVES-To compare the blood pressure, BMI and waist hip ratio of premenopausal women and post menopausal women.

To ascertain whether the parameters are significantly altered after menopause.

MATERIALS AND METHOD-200 women of Gauhati Medical College was chosen as subject.They were divided into two groups

GROUP I-115 premenopausal women between age 41to 48yrs who have experienced physiological change disrupting regular menstrual cycle that begin transition to menopause. Those women were

considered who have menstruation for last six month

GROUP II-85 post menopausal women between age group 40 to 54yrs whose menopause occurred naturally at a minimum of 1 year before the time of investigation

All the 200 women are healthy and intact ovaries ,uterus and adrenal and a history of normal menstrual cycle

ANTHROPOMETRY- **HEIGHT**-Height was measured using a vertical board with an attached metric scale .It was measured to the nearest .1cm with bare feet, body in close contact with the vertical board

WEIGHT-was recorded by making subject stand on a weighing machine .It was recorded to the nearest 0.1kg

BODY MASS INDEX-BMI was calculated as weight in kg/square of height in meters

WAIST/HIP RATIO-using a non elastic measuring tape ,waist circumference was measured in centimeters at the level of the midpoint between lowercostal margin and iliac crest. Hip circumference was measured in centimeters around the maximal bulge of gluteus maximus .Ratio of the two was taken .If WHR was more than 0.85,it was considered to be android type of obesity

BLOOD PRESSURE was recorded using a standard sphygmomanometer with subject in sitting posture cuff applied to right arm

STATISTICAL ANALYSIS-Student t test was used to find significant difference in obesity indices and cardiovascular parameters

COMPARISON OF CARDIOVASCULAR
PARAMETER IN BOTH GROUPS

Anthropometric parameters	Pre - menopause (Mean±SD)	Postmenopause (Mean±SD)	P Value
Systolic Blood Pressure mm Hg	116±1.35	137±2.09	<.01
Diastolic Blood Pressure mm Hg	96±10.8	139±8.04	<.01

TABLE 1

COMPARISON OF ANTHROPOMETRIC
PARAMETERS IN BOTH THE GROUPS

Anthropometric parameters	Pre-menopausal (Mean±SD)	Post menopausal (Mean±SD)	P Value
Waist hip ratio	0.77±.03	0.83±.04	<.01
BMI	21±4.10	28±4.11	<.01

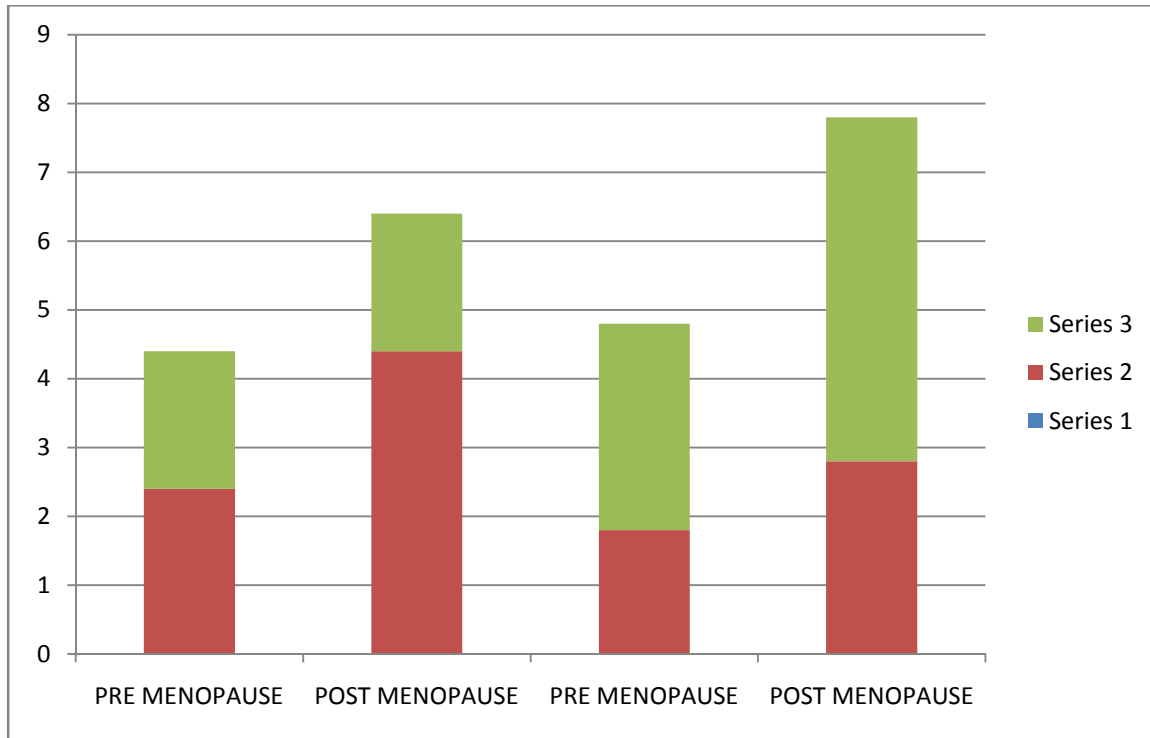
TABLE 2

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(SYSTOLIC BP) (DIASTOLIC BP)

Diagram 1

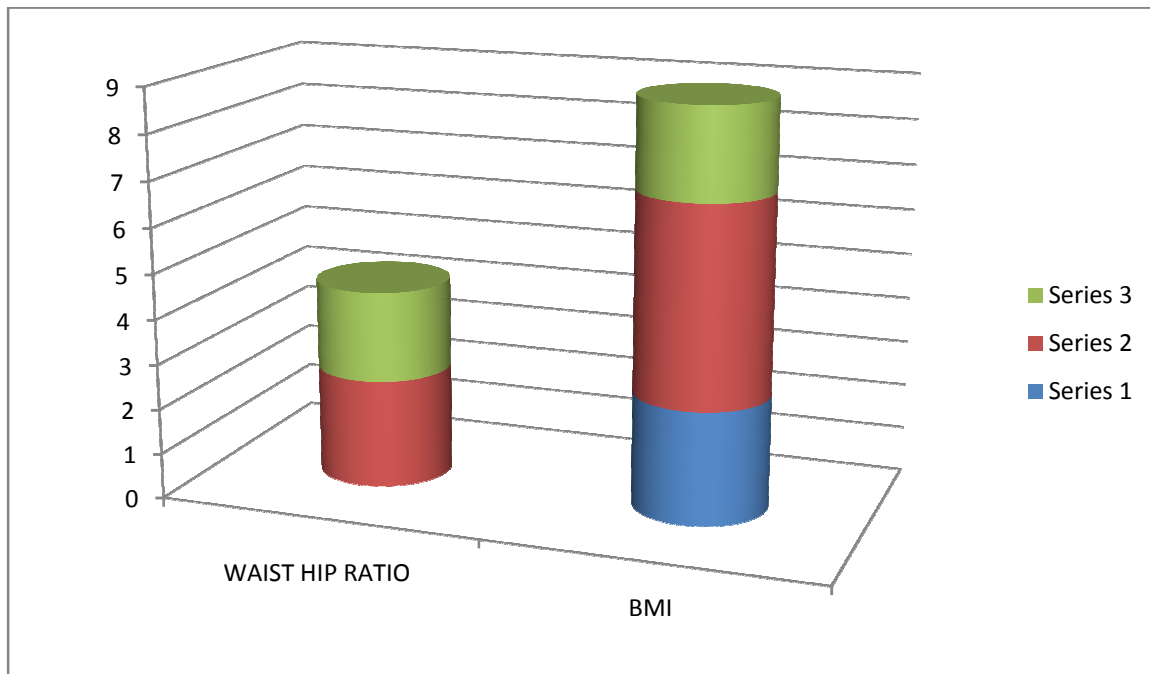


Diagram 2

RESULTS AND OBSERVATIONS- In the present study it was seen that BMI and WAIST HIP RATIO was significantly increased in post

DISCUSSION

In this study there was a statistically significant increase in BMI in the post menopausal women when compared with the premenopausal women. Similar significant increase in BMI in the post menopausal women has been reported, Choudhuri et al¹¹. Estrogen acts on proopiomelanocortin neurons, regulates their cellular activity through estrogen levels are closely associated with leptin levels¹². Leptin modulates energy balance in the hypothalamus by exerting an anabolic effect and exhibiting a lipolytic effect by controlling the expression of leptin specific receptors.¹³ After menopause the ovaries fail completely to produce estrogen resulting in deregulation of energy metabolism that may have induced an elevation in the total adiposity in the post menopausal women¹⁴. Because WHR is used to indicate the abdominal fat accumulation and is more predictive than BMI, we compare the WHR of the post menopausal women with the premenopausal women. There was statistically significant increase in WHR in the post menopausal women. Estrogen promotes and maintains the fat distribution by enhancing the usage of lipids as energy source and promotes abdominal fat reduction. Hence in post menopausal women the decline in estrogen results into increase in the abdominal fat leading to increased WHR. These findings are in well accordance with the findings of Kirchengerst et al in

menopausal women p value <.01. Systolic and diastolic blood pressure was also significantly increased in post menopausal women p value <.01

a study conducted among the Austrian women. Thus women gain the gynoid body fat pattern having greater amounts of body fat¹⁵. This shape has a plausible linkage to physiological mechanism regulating reproductive capability and good health. After menopause a typical increase in trunk fat tissue especially at the abdominal area [Kirchengerst et al 1997]¹⁶. With the menopause the more gynoid type of fat patterning may change towards a more android type [Yasujiet al, 2013]¹⁷. In the present study there were significant increase in body mass index. This study suggests that WHR, independent of BMI is related to cardiovascular risk factors. WHR was found to be significantly¹⁸

CONCLUSION- The present study showed that blood pressure, BMI and WAIST HIP RATIO is significantly increased in post menopausal women. So with advancing age, the risk of cardiovascular disease increase. Greater proportions of post menopausal women were hypertensive. Obesity and Hypertension resulting from menopausal transition. Waist Hip Ratio and blood pressure are easy and considered as basic tools. To evaluate cardiovascular risk. Steps must be taken to reduce the cardiovascular morbidity in this section of population. Probable conclusion can be drawn from these findings that with advancing age body mass index increases and fat distribution pattern also change. Centripetal fat distribution ratio showing higher values in menopausal women indicates android fat patterning

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