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Possible correlation of systolic, diastolic and pulse pressure with the life style and food habit of postmenopausal urbanites: An epidemiological studies

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Abstract

Postmenopausal women experience fluctuations in systolic and diastolic blood pressure. To find possible correlation of their blood pressure with the life style and food habit (vegetarian versus non-vegetarian, housewives versus working, well-nourished versus under-nourished), a cross sectional study comprising three hundred women that have undergone natural menopause and nope uterectomy was carried out in the Mithilanchal Heartland city of Darbhanga (Bihar). Data was collected through measuring blood pressure and questionnaire and was analysed by using Microsoft Office Excel. Our results show a strong relationship of hypertension with the life style and food habit of the ageing women. This study might prove very helpful in diagnosing the elderly maladies.

Keywords: estrogen, systole, pulse, hypertension, postmenopausal

Introduction

Postmenopausal women constitute a pivotal part of our society. They face multimorbidities like osteoporosis, heart diseases, diabetes, hypertension, etc. what are the role of systolic and diastolic blood pressure in stimulating hypertension is ambiguous, as their trends vary greatly. Succeeding sixty two years of age in women, Casiglia, *et al.* reported increase in SBP and decrease in DBP (Casiglia, Tikhonoff and Pessina 2005) [4] while Landahl *et al.* (1986) [9] found escalating trends in mean systolic/diastolic blood pressure in untreated women in from 38 years to 70 years then decrement from 79 years (Landahl, *et al.* 1986) [9]; Mature *et al.* (2019) observed slightly higher Systolic Blood Pressure (122 ± 2.18 mmHg) and Diastolic Blood Pressure (80.15 ± 1.16 mmHg); in 315 women (aged 30–70 years) (Maturi, *et al.* 2019) [2], (Staessen, *et al.* 1997) [15] had noticed an increasing trend (4mmHg per year) only in systolic blood pressure. John *et al.* reported highest systolic and diastolic blood pressure in women at ± 55 years in a group of 70 patients (John, Kumar and Narmadha 2012) [8]. Postmenopausal Kamptee women exhibit higher incidence of hypertension (33%) (Bagdey, Ansari and Barnwal 2019) [11] while Congolese (100 women, >50 years) were prehypertensive (38.5%) (Muchanga, *et al.* 2016) [11]. Hence, it is evident that systolic blood pressure and diastolic blood pressure vary with area studied as well as age. Hence, this study was designed and carried out to assess the relationship of systolic blood pressure, diastolic blood pressure and pulse pressure in postmenopausal urbanites.

Material and Method

Three hundred healthy post-menopausal women consisting of housewives as well as working, well-nourished and under-nourished, vegetarian and non-vegetarian which have experienced normal cessation of ovarian function were included in this cross sectional study conducted in the Mithilanchal heartland of Darbhanga, Bihar. Systolic and diastolic blood pressures were measured by Auscultatory method according to Shrivastava and Das (1983) with the help of sphygmomanometer and stethoscope. The first reading of mercury-level in the manometer was noted as systolic blood pressure (SBP) on hearing a clear tapping sound indicating a flow of blood from left ventricle into aorta and second reading as diastolic blood pressure (DBP) on hearing muffled and dull sound indicating returning of blood into ventricle. Pulse pressure is calculated by subtracting diastolic blood pressure from systolic blood pressure.

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Result and Discussion

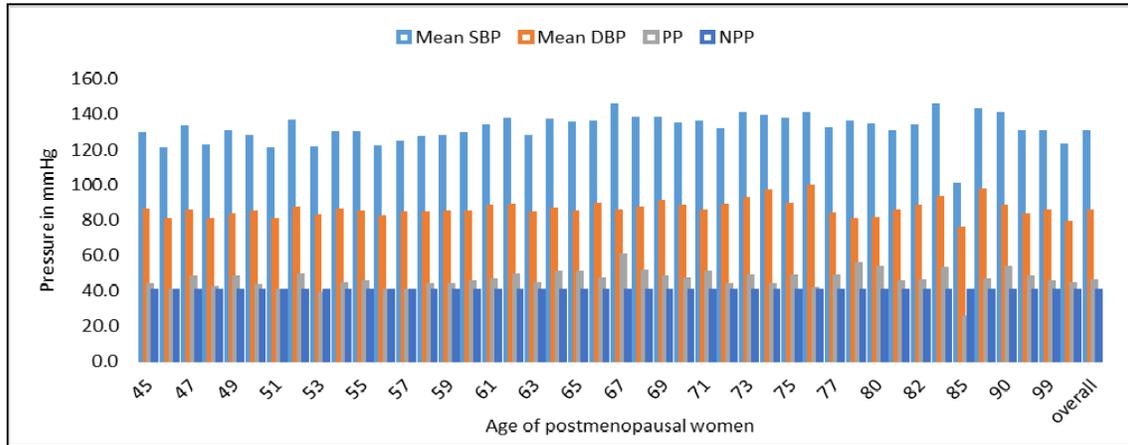


Fig 1: Showing SBP, DBP, PP, with Age in Postmenopausal Women

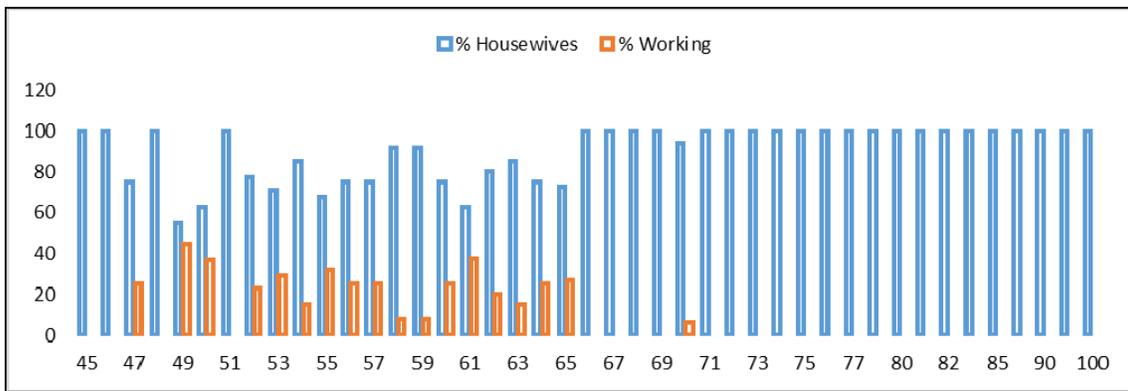


Fig 2: Percentage of Housewives and working women in the ages studied

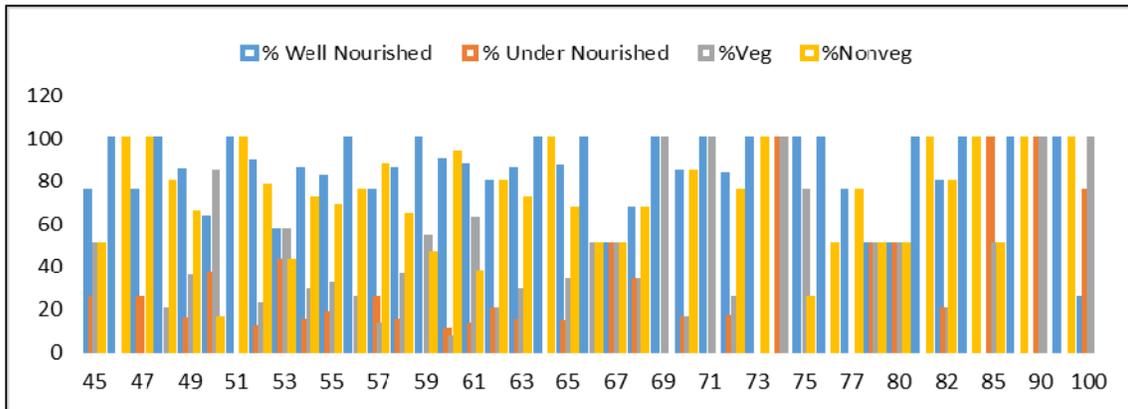


Fig 3: Percentage of well-nourished, under-nourished, veg and non-veg in the same age group

Figure 01 may establish pre-hypertensive but not hypertensive condition (Prehypertension - blood pressures between 120/80 mmHg and 139/89 mmHg and hypertension blood pressure $\geq 140/90$ mmHg (Collier, SR; Landram, MJ; 2012) ^[5] in postmenopausal subjects. It is an indication of developing cardiovascular diseases. Pulse pressure (PP) also exhibits increasing trends. Atrial fibrillation develops at a rate of 5.6% in persons with a pulse pressure of 40 mm Hg or less. (Homan and Cichowski 2019) ^[6]. Therefore, atrial fibrillation, aortic regurgitation may develop in most post-menopausal urbanites with increased pulse pressure. Ageing effects such as aortic

regurgitation results in increased pulse pressure. Increase in SBP and DBP may be attributed to loss of ovarian vasodilator oestrogen as well as stiffening of the arterial wall due to deposition of collagen I, III, calcification, and loss of elastin (ageing effect). From figure 1&2 it is evident that systolic blood pressure increases more in housewives than in working women which may be attributed to their mostly sedentary lifestyle and from figure 1&3 it is obvious that strong relationship exist between prehypertensive and well-nourished and non-vegetarian women. Hence, rise in blood pressure seems to be multifactorial. Rise in Systolic blood

pressure may also be the result of adaptation to less active life (Casiglia, Tikhonoff and Pessina 2005)^[4]. (Zanchetti, *et al.* 2006)^[16] noticed that menopause was significantly and positively correlated with SBP and DBP. Izumi *et al.* (2007)^[7] also reported a positive correlation between postmenopausal period and SBP or DBP (Izumi, *et al.* 2007)^[7]. The rise in systolic blood pressure and pulse pressure with aging is a consequence of arterial stiffness. Several factors have been shown to decrease arterial stiffness including aerobic exercise, decreased sodium intake, ω -3 fatty acids, estrogen replacement therapy, and ACE inhibitors. (Meeks 2002)^[10].

Conclusion

This study show positive correlation of systolic and diastolic blood pressure as well as pulse pressure with age, well-nourished, non-vegetarian food and sedentary life style. It may be due to less physical activity, mostly sedentary life style, loss of endogenous estrogen and aging effect. Genetic involvement might not be excluded. To mitigate these effects aerobic exercises such as cycling, jogging, yoga, low salt consumption, etc. might be suggested.

Abbreviations used:

PP = Pulse Pressure, NPP = Normal Pulse Pressure, SBP = Systolic Blood Pressure, DBP = diastolic Blood Pressure.

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