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ORIGINAL ARTICLE

DIETARY HABIT AS A RISK OF HYPERTENSION

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Abstract

OBJECTIVE: The objective of the present study was to explore relation between dietary habit and hypertension in middle aged hypertensive women. METHODS & RESULTS : 150 hypertensive individuals, aged between 40-60yrs, staying at Indore city, Madhya Pradesh, India were selected for study by systematic random sampling method. The retrieved informations included age, dietary habit (vegetarian/ non vegetarian), food preference, food consumption through 24hrs dietary recall and blood pressure. Overall frequency of hypertensive vegetarian samples were 82.67% and non-vegetarians were 17.33%. According to age specific distribution of hypertensive samples, those habitual in vegetarian diets were more hypertensive (89.19%) at the age 50-55 yrs ,followed by women at the age 55-60yrs (86.76%), women at the age 40-45yrs(80%) and women at the age 45-50yrs(64%).Whereas non vegetarian participants, at the age 45-50yrs, frequency of hypertension was highest 36.00%, followed by women at the age 40-45yrs (20%), women at the age 55-60yrs(13.24%) and women at the age 50-55yrs(10.81%). Mean systolic and diastolic blood pressure for non vegetarians were higher than that of vegetarians by 4.33 mm Hg and 4.72 mm Hg respectively. But systolic pressure did not differ significantly from vegetarian and non vegetarian food habits, whereas diastolic pressure differed significantly (level of significance 1%). CONCLUSION : Our results suggested that opting vegetarianism can not be considered the only way under lifestyle modification in prevention and management of hypertension, but onset of complications can be delayed . Weight management, improving nutritional status by dietary modifications (salt restriction, intake of fiber, antioxidants, minerals (calcium, potassium, magnesium) rich diet), physical activity, yoga, reduction in alcohol consumption will be considered with equal importance to maintain a quality of life.

Key Words : Hypertension , Vegetarian , Non vegetarian , middle aged women

INTRODUCTION

The burden of cardiovascular diseases has emerged in epidemic proportion in developing countries such as India in the past 2-3 decades[1]. Even within developing countries there are differences in the prevalence of hypertension. For example, in urban regions of India the prevalence of hypertension is greater [2-4] than in rural regions.[5-7] That is, hypertension is present in more than 30% of urban-dwelling adults and 10%- 20% of rural-dwelling adults. It is generally argued that the burgeoning epidemic of cardiovascular disease in developing nations

is mainly attributable to their transition towards industrialization and urbanization. Various hypotheses have been put forward to explain this rising trend and among these, consequences of urbanization such as change in life style pattern, diet and stress have been implicated. Dramatic changes in life style from traditional to modern have lead to physical inactivity due to technological advances. Rising affluence has modified the dietary pattern characterized by increased consumption of diets rich in fat, sugar and calories. Furthermore, increasing population growth at the current rate of about 2% in each year and ups and downs of nation s economy have created the situations leading to stress and hypertension in individual irrespective of gender, socioeconomic status.

Hypertension is an important risk factor for cardiovascular disease in women. Although younger, premenopausal women have lower blood pressures than age-matched men, population blood pressure rises with age, and the prevalence of hypertension is higher in older women. Oral contraceptive use increases the risk of hypertension in women.[8] At present time , there is a need for gender specific study on Prevention, Detection, Evaluation and Treatment of High blood Pressure. Early published literature showed that vegetarians seem to have lower levels of hypertension and cardiovascular disease risk [(9- 10)]. In contrary other literatures claimed that, fish [11] and food derived from meat [12] have blood pressure lowering effect .These diverse and collateral information provoked us to undertake the present study. The primary objective of this study was to explore the association between dietary habit and hypertension in an urban population.

MATERIAL AND METHODS

150 Sample were collected by systematic random sampling method. All individuals were hypertensive women, aged between 40-60yrs, staying at Indore city, Madhya Pradesh, India. The Objective behind the selection of this group of people as a sample: The women of this age group(premenopausal/menopausal/postmenopausal stage) are suffering from (a) hormonal imbalance and lack of endogenous estrogen (b)lack of physical activity ,(c) weight not according to the height, (d) ignorant about intake of nutritionally balanced diet for herself (e) under severe family & professional stress,(f) suffering from other physical ailments, these are the risk factors for onset of hypertension

Recruitment Characteristics of Sample : (i) Hypertensive female , age: 40-60yrs, urban dweller, belong to any socioeconomic status, any caste, any religion. (ii) Hypertensive patients will be selected having systolic blood pressure ≥140 mm Hg and/or diastolic blood pressure ≥ 90 mm Hg .[13] iii)Patients may be suffering from chronic hypertension or cases may be newly detected.(iv) Patients may be suffering from primary / secondary hypertension.(v)Patients are on anti-hypertensive medication. (vi) Last, but not least, willingness of the patients.

The following information were collected from each subject through a validated interview schedule like age (according to the date of birth mentioned by the study participants/ mentioned at any medical report or any valid document issued by Central/ State Govt), dietary habit like vegetarian(diet that excludes meat, eggs, fish and foods derived from animal other than dairy-products) or non-vegetarian (diet frequently consist of meat, fish and eggs), food preference, food consumption through 24hrs dietary recall.

Blood pressure was measured with a mercury column sphygmomanometer (Diamond Co., Industrial Electronics & Allied Products, India) using standardized technique.[14] Study

participants were instructed to refrain from drinking any caffeinated beverage before half-hour proceeding of the measuring blood pressure. Measurement was taken after the subject had rested for at least 5 min in a seated position. All blood pressure measurements was made on the left arm of each sample, using a cuff of appropriate size at the level of the heart. The cuff pressure was inflated 30 mm Hg above the level at which radial pulse disappeared, then deflated slowly at the rate of about 2 mm per sec and readings recorded to the nearest 2mm Hg. The first (appearance) and the fifth (disappearance) Korotkoff sounds were recorded as indicative of the systolic and diastolic pressure respectively. Average of the two readings were considered as blood pressure of the sample. If two readings differed by over 10 mm of Hg, third reading was taken and then three measurements was averaged

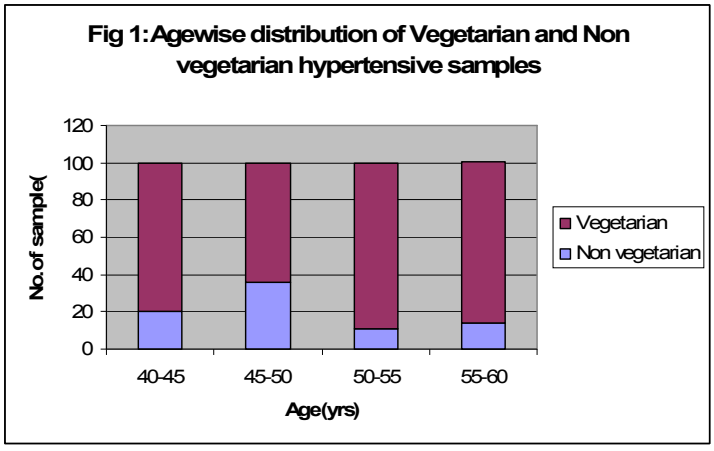
Statistical Package for Social Sciences (SPSS 17) was used for tabulation and statistical analysis of data. The responses of the samples were expressed in frequency and percentage. The collected data were analyzed for statistical significance by independent t-test.

Results

Table 1: Age wise distribution of vegetarian and non vegetarian samples

Age (yrs)	No. of Samples	No. of Vegetarian Sample (%)	No. of Non Vegetarian Sample (%)
40-45	**20**	**16 (80%)**	**4(20%)**
45-50	**25**	**16 (64%)**	**9(36%)**
50-55	**37**	**33 (89.19%)**	**4(10.81%)**
55-60	**68**	**59 (86.76%)**	**9(13.24%)**

Table :1 showing that overall frequency of hypertensive vegetarian samples are 82.67% and non-vegetarians are 17.33%.Accoding to age specific distribution of hypertensive samples, those habitual in vegetarian diets were more hypertensive(89.19%) at the age 50-55 yrs ,followed by women at the age 55-60yrs (86.76%), women at the age 40-45yrs(80%) and women at the age 45-50yrs(64%).Whereas non vegetarian participants, at the age 45-50yrs, frequency of hypertension was highest 36.00%, followed by women at the age 40-45yrs(20%), women at the age 55-60yrs(13.24%) and women at the age 50-55yrs(10.81%) (Fig : 1).



Mean systolic and diastolic blood pressure for non vegetarians were higher than that of vegetarians by 4.33 mm Hg and 4.72 mm Hg respectively. But systolic pressure did not differ

significantly from vegetarian and non vegetarian food habits, whereas diastolic pressure differed significantly (level of significance 1%) (Table :2a & 2b).

Table 2a: Mean , SD, & SE value of Systolic and Diastolic Blood Pressure of Vegetarian & Non Vegetarian Samples

	Food Habit	N	Mean	Std. Deviation	Std. Error Mean
Systolic Blood Pressure	Vegetarian	124	152.1333	11.54685	1.03694
	Non Vegetarian	26	156.4677	16.25332	3.187541.
Diastolic Blood Pressure	Vegetarian	124	89.0652	7.99937	.71836
	Non Vegetarian	26	93.7888	7.93906	1.55698

Table 2 : independent t test value of systolic and diastolic blood pressure of vegetarian and non vegetarian samples

		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
systolic blood pressure	Equal variances assumed	3.959	.048	-1.612	148	.109	-4.33439	2.68916
	Equal variances not assumed			-1.293	3.050E1	.206	-4.33439	3.35196
Diastolic blood pressure	Equal variances assumed	.021	.884	-2.741	148	.007	-4.72360	1.72326
	Equal variances not assumed			-2.755	3.644E1	.009	-4.72360	1.71471

DISCUSSION

It was well documented that vegetarian diet comprising fruits, vegetables, low fat dairy products, whole grain cereals, nuts, legumes was found to be effective in lowering blood pressure in hypertensive as well as non- hypertensive individual , because it was rich sources of potassium, magnesium, other minerals, antioxidants, and fiber [15-16] . In our study, it had been observed that people, those were in vegetarian diet through out their life, were also suffering from hypertension. Actually, this was not due the pros and cons of the vegetarian diet, neither religious beliefs / customs. It was due to individual s dietary habit (huge intake of salt, fried item, sweets, ghee, oil and less intake of fresh fruits -vegetables , low fat dairy products, whole

grain cereals, nuts, legumes) , faulty food preference due to lack of knowledge and awareness, lack of physical activity and weight management and unavoidable environmental stress. Similar type of observations were documented by Ornish and his colleagues [16- 17] .But again, it had been noticed that, irrespective of others, vegetarian diet were resisting the onset of hypertension at early age; due to having it s capability of weight loss and maintenance; changes in intramyocellular lipid; reductions in saturated fat intake; increased intake of fiber, minerals and antioxidants those can modulate valodialation mechanism ; reduced glycemic index and increased non-heme iron source, which were directly / indirectly responsible for maintaining the cardiovascular health. [19].

It had been observed that total frequency of prevalence of hypertensive non vegetarian individuals was low in compare to the vegetarians, may be due to the opting completely randomized study design. In present study, there was no significant difference in systolic blood pressure between vegetarian and non vegetarian hypertensive women, same observation reported by Harman and Parnell [20]. Again , our results indicated that mean systolic and diastolic pressure were higher incase of individuals with non vegetarian diet and higher chances of onset of hypertensive complications at earlier age(below 50yrs). The conclusions drawn by the Tzoulaki and his coworkers [21] can be documented in support of our observation, that non vegetarian food (meat, fish, poultry) were main source of non heme iron of the body, which was positively associated with blood pressure. But a very recent literature reported the possible role of low non heme iron intake, independent of heme iron intake, in the development of hypertension [22] .

In our study, we overlooked other demographic characteristics like (education, occupation, income); obesity; family history of hypertension, other comorbid diseases and in depth dietary intervention. But it was well known , urbanized lifestyle comprising lack of physical activity, environmental stress, environmental pollution, malnutrition (as women are underprivileged in Indian society) ; irrespective of all other risk factors of hypertension. So, it can be suggested that along with medical management, life style modification will be considered as an another half of disease management, comprising stress reduction, yoga, physical activity, weight reduction, improving nutritional status and changes in dietary practices like salt restriction, intake of fiber, antioxidants, minerals (calcium, potassium, magnesium) rich diet), reduction in alcohol consumption, which will ultimately help to maintain a quality of life.

CONCLUSION

It was well documented in our study that only neither vegetarian nor non vegetarian diet regimen can be recommended as a protective diet to follow hypertensive individuals, but onset of complications can be delayed in case of vegetarian diet. For management and prevention of hypertension, concept of adoption of healthy lifestyle will be considered first, which included stress reduction, yoga, physical activity, weight reduction , improving nutritional status and changes in dietary practices like salt restriction, intake of fibers, antioxidants, minerals (calcium, potassium, magnesium) rich diet), reduction in alcohol consumption, which will ultimately help to maintain a quality of life

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