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CORRELATION OF DIETARY HABITS, PHYSICAL ACTIVITY AND HYPERTENSION IN ADMINISTRATIVE OFFICERS IN WESTERN UTTAR PRADESH

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ABSTRACT: BACKGROUND: Sedentary lifestyle and dietary habits are modifiable risk factors for hypertension and change in these habits can lower the blood pressure. **OBJECTIVE:** This study aimed to correlate the hypertension with modifiable risk factors such as dietary habits among administrative class of Agra, Uttar Pradesh. **MATERIAL AND METHODS:** This cross sectional study was carried out in different administrative departments of Agra City and involved 150 personnel age 30 years or more who were interviewed with structured questionnaire (Dietary habits, daily routine, and exercise) and physical parameters of height, weight, BMI, blood pressure were taken to collect data. Chi - square test was done to analyse data. **RESULTS:** Overall prevalence of hypertension was 38%. It was positively correlated with overweight, obesity, physically inactivity, consuming extra salt in their diet. **CONCLUSION:** Government officials leading affluent lifestyle are at risk of developing spectrum of cardiovascular disorders due to unhealthy diet, stress and lack of physical activity as evident in this study. They need to be motivated to modify their lifestyle.

KEYWORDS: Physical activity, Dietary habits, Blood Pressure, Hypertension.

INTRODUCTION: Out of many non-communicable diseases, Hypertension has emerged as major cause of morbidity and mortality worldwide. According to reports by the World Economic Forum and the Harvard School of Public Health, Non-Communicable Diseases (2014) are estimated to account for 60% of all deaths in India, about 40% of all hospital stays and roughly 35% of all recorded outpatient visits. It has been estimated that CVD will be the major cause of morbidity and mortality in developing countries by the year 2020. Several studies carried out in the different parts India have reported increase in the prevalence of chronic diseases like obesity, hypertension, and their correlation with diet and lifestyle, etc. in urban as well as rural areas.

Hypertension is known as a silent killer as hypertensive patients remain asymptomatic, only few of them develop some symptoms. Asymptomatic patients are unaware of the disease and are at risk for developing complications like heart failure, stroke and kidney diseases.

A positive association has been observed between age, BMI, high intake of salt, high carbohydrate diet, as risk factors, and non-vegetarian diet as protective factor with respect to hypertension (Shyamal Kumar Das,¹ 2005, Radika G. et al 2007,² Shashank R. Joshi 2012.³)

All these factors are more common amongst people from upper social class along with the presence of other factors such as sedentary jobs, lack of physical activity, alcohol intake, Smoking.

People in this group often experience the mental stress due to nature of job contributed by Increasing urbanization, small or nuclear family norms and working couples. Routine health check-ups, screening programmes can help in identifying such undetected cases.

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This study was carried out to assess prevalence of hypertension and its correlation with dietary habits, daily routine and obesity among government officials of Agra.

MATERIAL AND METHOD: This cross sectional epidemiological descriptive study was carried out for duration of one and half years from March 2009 to August 2010 under Department of Physiology S. N. Medical college of Agra.

The study aimed to assess correlation of hypertension with dietary habits and lifestyle as risk factors among study population which comprised of personnel working in various government departments of Agra city.

According to various studies the overall prevalence of hypertension was 55% in 40-60 years of age group (WHO, 2001.⁴), 33.5% between 45-64 years of age group in urban population of south India.⁵ Based on these reports, a sample size was calculated and rounded off to 150 by using formula given by Cochran. Simple random sampling technique was used and all personnel working in administration were included irrespective of their age and gender. Cases of secondary Hypertension and subjects unwilling to participate were excluded.

A pre-tested semi structured questionnaire was used to collect data with their consent. Questions included about socio-demographic such as age, gender, education, marital status, family income, dietary habits, consumption of alcohol etc.

Using height and weight, Body Mass Index (BMI) was calculated and classified into categories of normal 18.5–25 kg/m², overweight (25–29.9) and obese (≥ 30).

Measurement of Blood Pressure: It was recorded by auscultatory method with mercury sphygmomanometer. Subjects were asked to take rest of five minutes prior to measurement and to avoid caffeine, smoking for at least 30 min and instructed as number of factors cause significant variations in measurement of blood pressure like nicotine consumption, exercise, bladder distension etc.

Those who were taking antihypertensive drugs were considered as hypertensive. JNC VII criteria was used to classify subjects as normotensive (SBP < 120 mmHg and DBP < 80 mmHg), Pre hypertensive (SBP 120–139 mmHg or DBP 80–89 mmHg) and Hypertensive (≥ 140 or DBP ≥ 90 mmHg).

Questions related to dietary habits inquired about preference of vegetarian/non vegetarian diet, addition of fruits in diet. They were asked about adding salt to their cooked meal with answer in form of yes or no and if answer was yes, they were further asked about a rough estimation of it in form of less than half teaspoon or more than it. (Feng J He 2012,⁶ Radhika G. 2007.⁷)

Frequency of eating outside in restaurants was asked in terms of occasionally or regularly as food items of these places is known to be rich in fat and have high calories.

Questions related to physical activity were asked to elicit their lifestyle in terms of sedentary to strenuous physical activity. This part of study included questions to divide study population into no exercise group, exercise group which was further divided into less than 30 minutes and more than 30 minutes spent per day doing some form of exercise. Questionnaire also inquired about yoga activity and answer was given in form of yes or no.

Government officials spend their maximum work hours sitting in making administrative decisions. Field work is also a part of some of the posts yet it does not involve any form of movement.

Questions were asked about number of hours they spend sitting in offices, less than 5 hours, 5-8 or more than 8 hours per day.

Questionnaire included family history either positive or negative. In case of positive history they were asked to specify relation with family member. Relations were categorised in parents, siblings, children to be more specific to assess familial trend.

RESULT AND DISCUSSION: In this study out of 150 personnel, there were 135 males and 15 females with overall prevalence of hypertension of 38% (39.2% of males and 26.6% of females, table 1) which was comparable to other studies (37.1% from Kerala, KR Thankappan et al 2006,⁸ 33.3% from Assam, Hazarika NC et al 2003.⁹) Age wise 15.3%, 36.7%, 50% were hypertensive in age group of 30-39, 40-49, 50-59 years respectively (Table 2).

Positive correlation of hypertension as well as prehypertension with overweight has been suggested by several studies. (Haresh Chandwani et al 2010,¹⁰ Yadav S. et al 2008.¹¹) 49.1% in overweight group, 31.8% in obese were hypertensives with higher prevalence of prehypertension in these groups (Table 3).

Unhealthy dietary habits such as diet rich in unsaturated fat, trans-fat, rich in calories, addition of extra salt are few of modifiable risk factors of cardiovascular diseases. Out of 150 participants in study, 63 were taking vegetarian diet and rest 87 were taking mixed diet (Table 4). Vegetarian diet is considered to be source of low intake of saturated fat, cholesterol and high source of dietary fibers along with phytochemicals. 42.5% (n=87) of taking mixed diet were hypertensive in comparison to 31.7% (n=63) of consuming vegetarian diet.

Subjects were asked about consumption of fruits and categorised in no or occasional, taking 1 to 3 times per day groups. 43.4% were hypertensive in no/occasionally consuming group in comparison to 29.3% in those who consume fruits regularly (Table 4).

Participants had to answer in yes or no form about addition of salt in cooked meal which already had salt in it. 63 out of 150 added extra salt 42.8% of this group had hypertension (Table 5). Out of those who did not add salt, 34.4% (n=87) suffered from hypertension. Addition of salt > 1 teaspoon/day at the dining table is associated with a higher prevalence for hypertension compared to zero added salt. (Radhika G2007.⁴) In this study out of salt addition group of 63 people 31 added >1 teaspoon per day and of these 54.8% (n=31) were hypertensive.

Out of 150 administrative personnel, 69 led sedentary lifestyle and were not doing any form of exercise and 50.7% (n=69) suffered from hypertension. 81 were engaged in some form of exercise, of which 51 did exercise roughly less than 30 minutes per day and rest 30 spent more than thirty minutes per day doing some form of exercise. 26.6% (n=30) had hypertension in those spending >30 minutes per day (Table 6). Physical activity which should be advocated for prevention/management of hypertension as even mild level of exercise for 30 minutes per day at least three to five times can be effective. (Lee L et al 2010,¹² Jervas E et al 2009.¹³)

In this study prevalence of hypertension was 31.2% (n=64) among regular yoga practitioners which was significantly lower in comparison to those who did not do yoga regularly.

A positive association between work hours and hypertension is suggested by many studies. (Haiou Yang et al 2008.¹⁴) In this study prevalence of hypertension was 60.3% in those who worked >8 hrs as compared to 30% who worked < 5 hrs. Per day. (Table 7)

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The short sleep duration (<7hours) has been associated with risk of hypertension. (Buxton OM et al 2010.¹⁵) In present study questionnaire inquired about a rough duration of sleep per day. 39.8% had hypertension in group 6-8 hrs./day and 34.6% in group <6 hrs. Results were insignificant.

Role of positive family history among parents or siblings in cases of hypertension has been considered as crucial non modifiable risk factors by several studies. (Stamler R et al 1979.¹⁶)

Prevalence of hypertension among personnel with positive family history (62.5% n= 32) was significantly higher than those with no family history in this study (Table 8).

There were several limitations in study. Collection of data as was done by questionnaire and answers were based on ability of subjects to recall and process. Estimation of salt intake in terms of quantity was one of the variables which posed difficulty. This cross study was only to ascertain extent and nature of physical activity and dietary habits rather than cause and effect between them and blood pressure variation.

Particulars	Frequency	Normotensive	Pre hypertensive	Hypertensive	$\chi^2 = 3.56$ df=2 p=0.168
Male	135	9(6.6)	73(54.1)	53(39.2)	
Female	15	3(20)	8(53.3)	4(26.6)	
Total	150	12(8)	81(54)	57(38)	

Table 1: Variations of Blood Pressure among Males and Females

Age (years)	No. Examined	Normotensives No. (%)	Prehypertensive No. (%)	Hypertension No. (%)	$\chi^2 = 9.58$ df=4 p=0.048
30-39	26	2(7.6)	20(76.9)	4(15.3)	
40-49	68	6(8.8)	37(54.4)	25(36.7)	
50-59	56	4(7.1)	24(42.8)	28(50)	
60-	0	0	0	0	
Total	150	12(8)	81(54)	57(38)	

Table 2: Stage Wise Distribution of Blood Pressure According to Age

BMI (kg/m ²)	No. examined	Normotensive No. (%)	Prehypertensive No. (%)	Hypertensive No. (%)	$\chi^2 = 27.7$ df=6 p= 0.01
< 18.5 (under wt)	3	3(100)	0	0	
18.5-25 (normal)	72	9(12.5)	39(54.1)	24(33.3)	
>25 - 30 (over wt)	53	0	27(50.9)	26(49.1)	
>30 (obese)	22	0	15(68.1)	07(31.8)	
Total	150		81(54)	57(38)	

Table 3: Variations of Blood Pressure According to Grades of Bmi (Kg/M²)

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Variables		Frequency	Normotensive No. (%)	Prehypertensive No. (%)	Hypertensive No. (%)	$\chi^2 = 6.48$ df=2 p= 0.03
Type of diet	Vegetarian	63	9(14.2)	34(53.9)	20(31.7)	
	Mixed diet	87	3(3.4)	47(54.0)	37(42.5)	$\chi^2 = 5.59$ df=2 p= 0.05
Inclusion of fruits	No/ occasionally	92	4(4.3)	48(52.1)	40(43.4)	
	Regularly (1 to 3 times/day)	58	8(13.7)	33(56.8)	17.29.3)	

Table 4: Correlation of Dietary Habits and Hypertension

Variables	Category	Frequency	Normotensive No.(%)	Pre hypertensive No.(%)	Hypertensive No.(%)	$\chi^2 = 2.50$ df=2 p= 0.28
Consumed extra salt	No	87	11(12.6)	46(52.8)	30(34.4)	
	Yes	63	1(1.5)	35(55.5)	27(42.8)	$\chi^2 = 4.20$ df=2 p= 1.22
Quantity of extra salt/diet	< ½ teaspoon	32	1(3.1)	21(65.6)	10(31.2)	
	< ½ teaspoon	31	0	14(45.1)	17(54.8)	

Table 5: Addition of Salt and Variations of Blood Pressure

Particulars		Total	Normotensive No. (%)	Prehypertensive No. (%)	Hypertensive No. (%)	$\chi^2 = 15.96$ df=4 p= 0.003
Exercise	No exercise	69	1 (1.4)	33(47.8)	35(50.7)	
	<30 minutes/day	51	5(9.8)	32(62.7)	14(27.4)	
	>30 minutes/day	30	6(20.0)	16(53.3)	8(26.6)	
Yoga	No	86	3(3.4)	46(53.4)	37(43.0)	$\chi^2 = 6.47$ df=2 p= 0.03
	Yes	64	9(14.0)	35(54.6)	20(31.2)	

Table 6: Exercise, Yoga and Variations of Blood Pressure

Particulars	Number of hours	Frequency	Normotensive No. (%)	Prehypertensive No. (%)	Hypertensive No. (%)
Work/office	<5	30	5(16.6)	16(53.3)	9(30)
	5-8	62	4(6.4)	45(72.5)	13(20.9)
	>8	58	3(5.1)	20(34.4)	35(60.3)

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Sleep duration	<6	52	7(13.4)	27(51.9)	18(34.6)
	6-8	98	5(15.3)	54(55.1)	39(39.7)
	>8	0	0	0	0

Table 7: Work Hours, Sleep Hours And Blood Pressure

Particulars	Frequency		Normotensive No. (%)	Pre hypertensive No. (%)	Hypertensive No. (%)	$\chi^2=$ 11.73 df=2 p= 0.0028
+ve	32		5(15.6)	12(37.5)	15(46.8)	
		Parents(23)	3(13.0)	9(39.1)	11(47.8)	
		Siblings(8)	2(25.0)	3(37.5)	3(37.5)	
		Children(1)	0	0	1(100)	
-ve	118		7(5.93)	69(58.4))	42(35.5)	
Total	150		12(8)	81(54)	57(38)	

Table 8: Family History of Hypertension Among Study Group

CONCLUSION: The high prevalence of hypertension, prehypertension and overweight as observed in this study needs great attention. One third of the employees were hypertensive which suggests that administrative personnel should be screened regularly. Several studies have shown that weight reduction through diet and regular physical exercise has been associated with reduction in blood pressure.

Personnel should be motivated to do life style modification such as increasing time of physical activity programs per week, dietary modification and low caloric diet and avoiding junk and fast foods. Stress has been strongly correlated with weight gain and high level of blood pressure so stress relieving healthy habits like yoga, walking should be included in daily routine.

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