

Determinants Of Hypertension In Faculties Of Various Colleges In Bhavnagar City

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Abstracts: Objective: To study various determinants of hypertension in faculties of various colleges in Bhavnagar city. Method: The present study was conducted among faculties of various colleges in Bhavnagar city. Total 407 faculties were enrolled in the study. Diagnosis of hypertension was done according to JNC VII criteria. Result: We found 27.5% prevalence of hypertension among the faculties. Non modifiable determinants of hypertension like age, gender and family history of hypertension were significantly associated with hypertension. Modifiable determinants of hypertension like smoking, extra salt intake, sedentary life style, co existence of diabetes mellitus and Obesity (BMI ≥ 25 kg/m²) were significantly associated with hypertension. Conclusion: Hypertension is a major health problem and both non modifiable and modifiable determinants affect hypertension. [Shah M et al NJIRM 2012; 3(4) : 109-113]

Key Words: Prevalence of Hypertension, tobacco use, Obesity, Sedentary life style

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Introduction: Hypertension is a modern day's epidemic and it is becoming a public health emergency worldwide, especially in the developing countries¹.

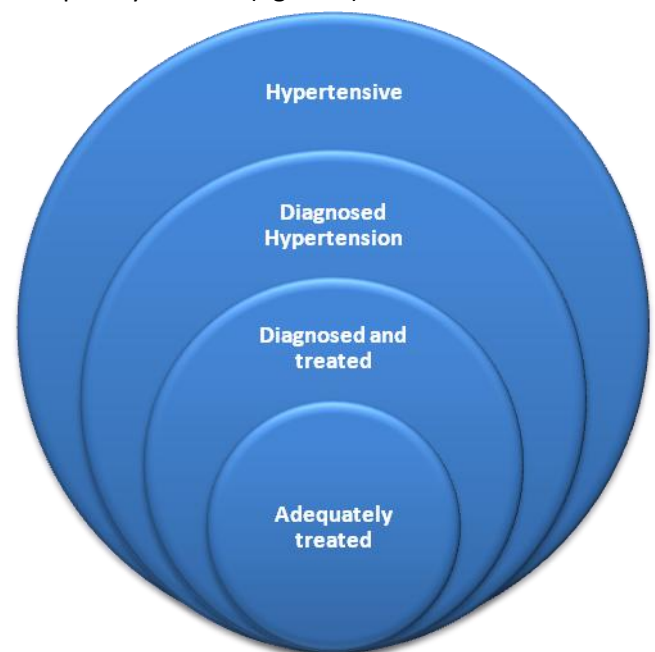
According to the report of the Seventh Joint National Committee on Hypertension, hypertension (HT) is now a major public health problem affecting 1 billion individuals worldwide², and accounting for 6% of deaths worldwide³.

Hypertension is an important public health problem also in India⁴. Epidemiological studies show a steadily increasing trend in hypertension prevalence over the last 50 years converse to findings from developed countries where there has been a significant decline⁴. Recent Indian studies using the newer criteria for hypertension diagnosis ($\geq 140/90$) and reported prevalence of 30.9% (Jaipur), 36.5% (Delhi) and 40.4% (Mumbai)⁴.

Hypertension is an important risk factor for cardiovascular diseases including coronary artery disease, congestive heart failure (CHF) and haemorrhagic stroke, renal failure, peripheral arterial disease and retinopathy³.

Hypertension exerts an 'iceberg' phenomenon⁵. It became evident in the early 1970s that only about half of the hypertensive subjects in the general population of most

developed countries were aware of this condition, only about half of those aware of the problem were being treated & only about half of the those treated were considered adequately treated⁵(figure-1).



[Figure-1 'Rule of halves' for Hypertension]

Both environmental and genetic factors may contribute to hypertension prevalence³. Obesity and weight gain are strong independent risk factors for hypertension. It has been estimated that 60% of hypertensives are overweight⁴. Additional environmental factors that may

contribute to hypertension include alcohol consumption, psychosocial stress, and low levels of physical activity³.

The problem which lies with the hypertension is that it cannot be cured completely and its management requires lifelong medication with some life-style modifications. The only way to curb the problem of hypertension is by its prevention¹.

Teachers usually have sedentary lifestyle and because of better socio-economic status, they are exposed to various modifiable risk factors of hypertension. Teachers being the torch bearer of new knowledge in the society & looked upon as a role model by students, so teachers must be healthy & fit, as well as aware about causes & effects of hypertension. With early diagnosis of undetected cases, specific management of Hypertension can be done and further complications can be prevented. Added to that, there is no such study conducted anywhere in this group.

With this background, it was decided to conduct present study among the faculties of various colleges in Bhavnagar city to find baseline information for future purpose.

Material and Methods: A Community based cross-sectional study was conducted in the all the colleges situated in Bhavnagar City. Total 457 faculties were enrolled in various colleges. Due to non response or some faculties were on leave, 407 faculties were covered.

After clearance from Institutional review Board, with prior permission from principal of various colleges of Bhavnagar city I started my data collection. Then after applying inclusion & exclusion criteria I selected my study subjects. First I took consent from the faculty & then filled the questionnaire form & performed necessary examination. The subjects who found to be hypertensive were referred to Sir T. Hospital for further evaluation and management.

Blood pressure was measured using JNC VII² standard method by a mercury sphygmomanometer with the subject sitting quietly for at least 5 minutes in a chair (rather than on an examination table), with arm supported at heart level. Caffeine, exercise, and smoking was avoided for at least 30 minutes prior to measurement. Initially systolic blood pressure was measured using Palpatory method. The cuff was inflated 20 to 30 mm Hg above this level for the auscultatory determinations; the cuff deflation rate for auscultatory readings was 2 mm Hg per second. SBP was the point at which the first of two or more Korotkoff sounds was heard (onset of phase 1), and the disappearance of Korotkoff sound (onset of phase 5) was used to define DBP. Two measurements were and the average was recorded. According to JNC VII classification Person was considered hypertensive if his/her systolic blood pressure ≥ 120 mm Hg and/ or diastolic blood pressure ≥ 80 mm Hg or s/he was on hypertensive treatment.

Subjects who smokes/chew tobacco atleast once daily in any form was considered as current smoker/tobacco chewer. Extra salt in diet by study subjects is decided by if he/she uses table salt in already cooked food. Oil intake was calculated by dividing total monthly intake of family by number of family members so we can get individual Oil intake. Oil consumption >20 grams of oil per day (visible fat) is considered as high fatty diet For classifying obesity, Body Mass Index (BMI) ≥ 25 kg/m² was considered obese⁵. Person is considered having diabetic if he/she knew the status for the same and person taking treatment for it.

Statistical analysis: Data entry was done in Microsoft office excel sheet 2007. Data Analysis was done in epi info 3.2. Software, SPSS trial version 17. Pearson's Chi-square and Chi-square test for trend analysis were used for analysis of the various determinants of the study.

Results: A total of 407 faculties were studied. The study subjects consist of 271 males (66.6%) and 136 females (33.4%). Out of 407 faculties

112 faculties had hypertension. So, prevalence of Hypertension among study subjects was 27.5%. Out of total 112 hypertensive subjects only ¼ th (28) of the faculties were aware of their Hypertension status and remaining ¾ th (84) were diagnosed for the first time as having hypertension.

Table 1 indicates the influence of non-modifiable risk factors on Prevalence of Hypertension. Regarding Age, as the age advances the risk of developing hypertension increases. Males are also at higher risk of developing hypertension compare to females due to exposure various harmful habits. In addition to this, female sex hormones might also play a protective role. Out of 407 study subjects, 189 (46.4%) have positive history of hypertension. Prevalence of hypertension is also higher in subjects with family history of hypertension suggesting genetic role in development of hypertension.

Table 2 depicts the impact of modifiable risk factors on Prevalence of Hypertension. The difference in prevalence of hypertension was statistically significant between current smokers and non smokers & current tobacco chewer and non tobacco chewer. Prevalence of hypertension was higher in alcoholics as compared to non alcoholics. But that difference was not statistically significant. Prevalence of

hypertension was also higher among the subjects having habit of extra salt intake, having sedentary life style, co-existence of DM and BMI $\geq 25 \text{ kg/m}^2$ and this difference among them was statistically significant. Prevalence of hypertension among study subjects having oil intake $> 20 \text{ ml/day}$ was 29.5%, which was higher than overall prevalence but this difference was not statistically significant.

Table 1 Prevalence of various non-modifiable risk factors and its association with hypertension

Risk factors	Subjects (%)	Hypertensive (%)	X ² Value	p-value (df)
Age Group (In Years)				
21-30	152(37.4%)	13(8.6%)	59.75	<0.001 [#] (3)
31-40	108(26.5%)	31(28.7%)		
41-50	88(21.6%)	34(38.6%)		
>50	59(14.5%)	34(57.6%)		
Sex				
Male	271(66.4%)	89(32.8%)	10.73	< 0.001 [#] (1)
Female	136(33.4%)	23(16.9%)		
Family History of Hypertension				
Present	189(46.4%)	70(37.0%)	15.15	< 0.001 [#] (1)
Absent	218(53.6%)	42(19.3%)		

Significant

Table 2 Prevalence of various non-modifiable risk factors and its association with hypertension

Risk factors	Subjects (%)	Hypertensive (%)	X ² Value	p-value(df)
Current smoker(*n=271)	32*(11.8%)	23(71.9%)	23.09	<0.001 [#] (1)
Current tobacco chewer(*n=271)	41*(15.1%)	23(56.1%)	10.63	<0.001 [#] (1)
Alcohol intake in last one year (*n=271)	45*(16.6%)	20(44.4%)	2.64	0.10(1)
Additional dietary Salt intake	124(30.5%)	43(34.7%)	4.081	0.043 [#] (1)
Sedentary life style	252(61.9%)	86(34.1%)	13.63	<0.001 [#] (1)
H/O DM	37(9.1%)	16(43.2%)	4.22	0.04 [#] (1)
BMI $\geq 25 \text{ kg/m}^2$	189(46.4%)	79(41.8%)	44.41	<0.001 [#] (2)
Oil intake ($> 20 \text{ ml/day}$) (†n=299)	258 [†] (86.3%)	76(29.5%)	0.001	0.980(1)

Significant

Discussion:

The study subjects were consisting of 407 faculties. Only one fourth subjects were aware about their hypertension status & only 43% of known cases

had controlled hypertension. Similar results were also found in study conducted by Momin Mohmmedirfan et al¹ that, 43% of the study subjects were aware about their hypertensive

status and among these known hypertensives 51% were having controlled hypertension.

Prevalence of hypertension was 27.5% in study subjects. Prevalence of hypertension was 30.7% and 30.4% in studies conducted by Patricia M Kearney et al⁶ and Momin Mohmmedirfan et al¹, respectively.

Prevalence of hypertension was increasing as the age advances. Prevalence of Hypertension was 8.6% in 21-30 years age group to 57.6% prevalence in age \geq 50 years (P value $<$ 0.001). Dr Pankaj Mandal et al⁷ also found that as the age advances Prevalence of hypertension also increases. In males, 3.8% prevalence in 20-29 years age to 60.9% in subjects aged \geq 60 years. In females, 7.1% prevalence in 20-29 years age to 41.8% in subjects aged \geq 60 years (P value $<$ 0.01).

Statistically significant difference was found in prevalence of hypertension between males (32.8%) and females (16.9%) (P value $<$ 0.001). Similar results were obtained by Haresh Chandwani et al⁸ that, prevalence of hypertension was found significantly higher in men (25.5%) than women (22.0%) (P value $<$ 0.01, OR=2.29, 95% CI) Hypertension Prevalence was higher among the study subjects having family history of hypertension (37.0%) compared to subjects not having family history of hypertension (19.3%). Wenyu Wang et al⁹ in their Longitudinal study of Hypertension Risk factors and their relation to cardiovascular disease- The Strong Heart Study revealed that risk of developing HT was higher in subjects with parental history of hypertension (P= 0.0124, OR=1.27, 95% C.I.).

Statistically significant difference was found in prevalence of hypertension among current smoker (71.9%) and current tobacco chewer (56.3%) (P value $<$ 0.001 & 0.0011 respectively). Sunil Sagare et al¹⁰, in their study on modifiable risk factors in hypertension found that habit of smoking atleast once daily was associated with risk of hypertension. This association was statistically significant (Chi-square=8.35, df=1, P-value=0.003).

Hypertension prevalence was higher among subjects with history alcohol intake (44.4%) compared to subjects having no history of alcohol intake (16.6%) in last one year, but difference was not statistically significant (P value= 0.10).

Higher proportion of hypertension was found among the subjects using extra salt in their diet (34.7%) than those who do not using it (24.4%) (P value 0.043). Sampatti Sambhaji Todkar et al¹¹, in their study revealed that risk of development of hypertension was 6.36 times higher in subjects with history of additional dietary salt intake (28.99%) compared to subjects with negative history of additional dietary salt intake (6.77%).

Higher prevalence of hypertension observed among the subjects consuming $>$ 20 ml/day oil (29.5%), but the difference was not statistically significant. It might be due the fact that more than 100 subjects had not responded the question.

Study subjects enjoying sedentary life style had higher prevalence of hypertension (34.1%) compared to those who were engaged in some form of physical activity (16.8%) (P value $<$ 0.001). B.S. Deswal et al¹² in their study revealed that relative risk of developing hypertension was 2.73 in persons subjects engaged in sedentary habits compare to non-sedentary habits.(Chi-square=8.80, df=1, P value $<$ 0.01).

Obesity was measured in terms of BMI. Subjects having BMI \geq 25 kg/m² had higher blood pressure(41.8%) as compared to subjects having BMI $<$ 25 kg/m²(P value $<$ 0.001). Momin Mohmmedirfan et al¹ also found prevalence of hypertension was 42.4% in subjects having BMI 25.0-29.9 kg/m² and 53.1% in subjects having BMI \geq 30 kg/m² (P value $<$ 0.01). Dr Pankaj Kumar Mandal et al⁷ in their study found that highly significant statistical difference (P value $<$ 0.001) in the prevalence of hypertension in subjects with BMI \geq 25 kg/m² (66.4%) to subjects with BMI $<$ 25 kg/m²(11.4%).

Significant difference in prevalence of hypertension was found between the subjects

having co existence of Diabetes (43.2%) as compared to non-diabetics (25.9%). Haresh Chandwani *et al*⁸ also found that 6.9 times higher risk of developing hypertension in diabetics compare to non-diabetics. (P Value < 0.001, OR=6.9, 95% CI).

Conclusion: The prevalence of Hypertension was found 27.5%. It is evident from findings of present study conducted in faculties of Bhavnagar city that risk of hypertension is significantly associated with non-modifiable factors like age, sex and family history of hypertension. Hypertension risk is also associated with modifiable risk factors like tobacco consumption, additional salt intake, sedentary life style, co-existence of diabetes mellitus & obesity. Factors like daily fat intake > 20 ml/day and consumption of alcohol in last 1 year had prevalence of hypertension more than the average but not statistically significant.

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