Study of Hypertension and Its Associated Risk Factors among Young Adults (20-45 Yrs) In a City Of Maharashtra

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ABSTRACT

Background: Hypertension is the most common of all the cardio-vascular diseases and affects many people in developed as well as developing countries With a growing problem of hypertension worldwide, there is a concern that hypertension in young adults may also be on the rise and that cases are not detected because of inadequate screening at this age group. Therefore the need arises to conduct this study to find out the prevalence of hypertension in young population and correlation of various factors associated with it.

Methods: Present study was conducted during July 2012 to November 2014 in urban area of Maharashtra, India. Total 1590 study participants aged 20-45 years from the urban area were screened for the prevalence of hypertension and the factors associated with it. Probability proportionate sampling method use for sampling the study population for prevalence of hypertension among young adults. Informed consent was obtained from the study subjects before the conduction of the study. The data was recorded in pre-designed and semi-structured proforma.

Results: In the present study prevalence of hypertension was found to be 20.3% in urban population aged 20-45 years. Statistically significant association was observed between hypertension and age, occupation, socio-economic status, family history of hypertension, sedentary life style, smoking, smokeless tobacco and alcohol consumption.

Keywords: Hypertension, young adults, smoking, socioeconomic status, alcohol.

INTRODUCTION

Hypertension is the most common of all the cardiovascular diseases and affects many people in developed as well as developing countries. It is recognized as an important public health problem all over the world. It is often asymptomatic and can lead to lethal complications if left untreated.[1] Hypertension is considered as an 'Iceberg' disease' because unknown morbidity far exceeds the known morbidity.[2,3] In considerable proportion of cases the disease tends to be asymptomatic for prolonged time, hence also labeled as 'Silent Killer'.[3,4] It is reported to be the seventh highest contributor to premature death in developing countries. It has been postulated that identification of persons at risk of developing hypertension may permit earlier detection and perhaps prevention of this condition.[5] Cardio vascular disease also typically occurs at a younger age in developing than in developed countries.[6]

While most studies describe hypertension in older adults and the elderly there is a paucity of data on hypertension in teenagers and young adults, as they are deemed to be at lower risk of developing the disease. With a growing problem of hypertension worldwide, there is a concern that hyperten-

sion in young adults may also be on the rise and that cases are not detected because of inadequate screening at this age group.[7] A shift in the age group of cases from the old to the young, also known as the era of "baby boom generation" will contribute to the increase in the age group at risk at 10 or 20 years ahead. Most of the hypertensive cases are diagnosed accidentally. So it is very important to detect such cases as early as possible. Therefore the need arises to conduct this study to find out the prevalence of hypertension in young population and correlation of various factors associated with it. It will be helpful to prevent most cardiovascular complications including congestive cardiac failure, stroke, myocardial infarction, and sudden death, in age group of 20 to 45 years.

AIM

The study aim to study hypertension and its associated risk factors among young adults (20-45years) in urban area.

OBJECTIVE

Objective of the present research was to study prevalence of hypertension among young adult (20-45years) and also to study some risk factors associated with hypertension among young adults (20-45yrs).

MATERIAL AND METHODS

The present study was undertaken with an objective to determine the prevalence of hypertension and its associated risk factors among young adults (20-45 years) in a city of Maharashtra.

Study Design: It was a community based cross sectional study.

Study period: Present study was conducted during July 2012 to November 2014. Intensive literature review to assess the feasibility and the operational issues was done in 6 months from July 2012- December 2012. Data collection was completed in 12 months January 2013 - December 2013 followed by analysis and interpretation in further 6 months January 2014-June 2014. Writing report and printing and submission was done from July 2014-November 2014.

Study site and population: A community based study survey covering various risk factors for the hypertension among the young adult was conducted in a city of Maharashtra state. According to census 2011, total population of the city was 430733 distributed in 65 municipal corporation wards. Municipal corporation was further organized into five geographical Divisions for effective delivery of services and management.

Sample size: Prevalence of Hypertension among the age group of 20-45 year is about 21% [8], thus considering prevalence p=21 %, the calculated sample size was 1504 using following formula[9] n= $z^2 p(1-p)/e^2$. 5% population added to 1504 as non response or incomplete answers. Thus after rounding the sample size was 1590. Here, z = 1.96 for 95% confidence interval; n = size of study population, p= estimated proportion in study population, and e= allowable error which is considered here as 10% of total prevalence

Estimating 53 study subject from each 30 wards were selected for entire sample of 1590 study subjects.

Sampling procedure: Probability proportionate sampling method (therese McGinn. RHRC Consortium Monitoring and Evaluation Toolkit. PPS sampling technique used for sampling the study population for the prevalence of hypertension among young adults.

Selection of the study subject: The wards which we had selected primary sampling unit, surveyed to detect centre of ward. Any temple, shop, mosque or hotel situated approximately at centre of ward was marked and a bottle rotated there to select the lane for the survey. Survey was started from the lane towards which mouth of the bottle directed. Each house on that lane was visited and at the end of lane, survey was continued on left turn to the initial lane till cluster of 53 samples satisfying the inclusion criteria of study completed. If there were no subjects in the house satisfying the inclusion criteria then that house was skipped and next house visited. If there was more than one subject in house satisfying the inclusion criteria, then all included in study. This method was adopted in all wards for selection of cluster for study.

Inclusion criteria: 1) Young adults of age 20 to 45 years in study population. 2) Resident of study area more than 6 months. 3) Study population who have given voluntary consent. 4) Diagnosed cases of hypertension.

Exclusion criteria: 1) Persons less than 20 years of age and above 45 years of age. 2) Not permanent resident of the study area. 3) Seriously ill subjects (non ambulatory) 4) Pregnant women.

Ethical consideration: Ethical committee approval was obtained prior to the start of the study from institutional ethical committee of government medical college.

Categorization of subjects by blood pressure levels: [10] Subjects were divided in to normotensive or hypertensive on the basis of their blood pressure lev-

els and prehypertensives were included as normotensives. Normotensive: Systemic blood pressure less than 120 mm Hg and diastolic blood pressure less than 80 mm Hg. Hypertensive: Systolic blood pressure 140 mm Hg or above Diastolic blood pressure 90 mm Hg or above. Prehypertensive: Systolic blood pressure in the range of 120 mm Hg to 139 mm Hg or Diastolic blood pressure 80 to 89 mm Hg.

Data analysis: Data entry: It was done by using MS office - Microsoft Excel 2007 software.

Statistical analysis: Statistical analysis was carried out with help of statistical measures, such as percentages, proportion, and chi square test using software Graph Pad Prism Version 5.01.

Reference citation: Reference citation was done by Vancouver referencing style.[11]

RESULTS

One thousand five hundred eighty persons aged 20-45 years age recruited in study. Highest number of study subjects were in age group of 26-30 years (22.9%) followed by 31-35 years (20.3%). Mean age of the study subject was 31.48, median was 32 and Standard deviation was 6.83. Mean age of the male subject was 31.69 and standard deviation of 6.66. Mean age of the female study subject was 31.30 and standard deviation of 6.96. Of the total 1,580 subjects examined, 731 (46.3%) were males and 849 (53.7%) were females. Out of 1580 study subjects 575 (36.4%) were Hindus, 483 (30.6%) Muslims, 359 (22.7%) were Buddhist and 128 (8.1%) were Sikh while 35 (2.2%) subjects belong to other religion like Jain, 24 (1.5%) and Christian,11 (0.7%). It was observed that out of total study subjects 61 (3.9%) belong to Upper socioeconomic class, 308 (19.5%) belongs to upper middle, 369 (23.4%) belong to lower middle class, 628 (39.7%) belong to upper lower and 214 (13.5%) belong to lower socioeconomic class. Of the total 1580 subjects 967(61.2%) were from nuclear family, 171 (10.8%) belong to joint family and 442 (28%) belong to third generation family.

320 study subjects out of 1580 were hypertensive indicating that the prevalence of hypertension in area studied was 20.3%. Table 1 shows distribution of study subject according to JNC VII criteria. It shows that 45.4% (719/1580) were normotensive, 34.2% (541/1580) study subjects were pre hypertensive and 19.4% (307/1580) were in hypertension stage I and 0.9% (13/1580) were having hypertension II stage. Table 2 shows relation between age of study subjects and prevalence of hypertension.

Prevalence of hypertension was 11.3% (35/309) in the age group 20-25 years, 15.3% (60/392) in age

group 26-30 years, 22.2% (71/320) in age group 31-35 years, 23.8 % (72/302) in age group 36-40 years and 31.9% (82/257) in age group 41-45 years. Prevalence of hypertension was increased with advancing age and highest prevalence was seen in the age group 41-45 years (31.9%). Prevalence of hypertension was observed more in males as compared to females but the difference was not statistically significant (χ^2 = 0.386, df = 1, p=0.538). Present study shows the prevalence of hypertension was highest 29.5% (18/61) among study subjects belonging to Class I socioeconomic status followed by 24.7% (76/308) Class II, 19.2% (71/369) Class III, 17% (107/214) Class IV, and 22.4% (48/214) in Class V. The Chi-square test for socioeconomic status and hypertension is found to be statistically significant (χ^2 =11.845; df=4; p= 0.019). Prevalence of hypertension was high 38.9% (122/314) among subjects with positive family history of hypertension compared to 15.6% (198/1266) among study subjects with negative family history of hypertension.

Table 1: Distribution of study subject according to JNC VII criteria

Status	SBP mmHg	DBP mmHg	Cases	Prevalence
Normotension	<120	And or <80	719	45.5
Pre HT	120-139	or 80-89	541	34.2
HT stage I	140-159	or 90-99	307	19.4
HT stage II	≥160	or ≥ 100	13	0.9

HT= Hypertension

Table 2: Association between age distribution and hypertension

Age distribution	Hypertensive	Normotensive	Total
20 -25	35(11.3)	274(88.7)	309(19.6)
26-30	60(15.3)	332(84.7)	392(24.8)
31 -35	71(22.2)	249(77.8)	320(20.3)
36-40	72(23.8)	230(76.2)	302(19.1)
41-45	82(31.9)	175(68.1)	257(16.3)
Total	320(20.3)	1260(79.7)	1580(100)

(Figure in denotes percentages) (χ^2=45.941, df=4, p=0.00)

Table 3: Association between family history of hypertension and hypertension among the study subjects

Family History	Hypertensive	Normotensive	Total
Yes	122(38.9)	192(61.1)	314(19.9)
No	198(15.6)	1068(84.4)	1266(80.1)
Total	320(20.3)	1260(79.7)	1580(100)

(Figure in parenthesis denotes percentages) (χ^2= 83.944, df =1, p<0.001)

Statistically it was also found that hypertension is significantly higher among people having positive family history in comparison to person having

negative family history (χ^2= 83.944, df = 1, p < 0.001). It was found in present study that out of total 1580 subjects 9.9% (156/1580) found to be alcoholics and all were males while 90.1% (1424/1580) found not consuming alcohol. It was observed that among the alcoholics 29.5% subjects found to be hypertensive and 19.2% (274/1424) were found hypertensive among the non alcoholics. The difference was found statistically significant (χ^2=9.138, df=1, p=0.003). It was found that 20.5% (324/1580) study subjects were using smokeless tobacco while 79.5% (1256/1580) were not using smokeless tobacco. The prevalence of hypertension in smokeless tobacco users was 25 % (18/324), and in non smokeless tobacco users it was 19% (239/1256). The association between smokeless tobacco use and hypertension was statistically significant (χ^2 = 5.686, df = 1, p=0.017). It was found that 20.9% (14/67) were found hypertensive among the smoker with 1-5 years duration of smoking while 79.1% (53/67) were normotensive. Prevalence of hypertension was found in 38.8% (21/54) among the smokers with 6-10 years duration of smoking. While highest prevalence 41.9% (13/31) was found among the smokers with duration of the smoking 11-15 years of smoking. The association between duration of the smoking and the prevalence of hypertension was found statistically significant (Chi square test for trend χ^2= 5.561, df = 1, p < 0.05). Out of the total study subjects 16.7% (264/1580) were underweight, 53.6% (847/1580) were having normal BMI (BMI 18.5-24.99), 23.7% (374/1580) were Pre-obese (BMI 25-29.99) and 6% (95/1580) were Obese as per the WHO classification for the BMI. It has been observed that prevalence of hypertension was 32.6% (31/95) among the obese, 29.1% (109/374) among the pre obese, 17.4% (147/847) among normal BMI, and 12.5% (33/264) among the underweight subjects. The association between the BMI and the hypertension found statistically significant (χ^2= 41.547, df= 3, p < 0.001). Prevalence of hypertension was 16.4% (86/523) among subjects performing heavy physical activity, 20.9% (182/870) among subjects performing moderate physical activity and 27.8% (52/187) among subjects performing light physical activity. The association between physical activity and prevalence of hypertension was highly significant (χ^2 =11.56, df = 2, p <0.003).

DISCUSSION

Prevalence of hypertension was increased with advancing age and highest prevalence was seen in the age group 41-45 years (31.9%). Joshi et al (2000)[12] in study conducted in the urban area of Mumbai on prevalence of the hypertension documented Hypertensive subjects (7.77%) showed increased prevalence with age which increased near-

ly fourfold in 30-49 age group and incidence was higher in females (10.57%) than in males (6.13%). Das SK (2005)[13] in their study conducted in the urban area of Malda, a district town in the state of West Bengal study the prevalence of hypertension in an urban community of India using the JNC VII criteria, with the aim of identifying the risk factors and suggesting intervention strategies. They documented increase in the prevalence of hypertension as the age increases. Todkar et al (2009)[14] found that the prevalence of hypertension was increased significantly with increasing age. Pooja and Mittal Y (2013)[15] in their study conducted in urban area Dehradun in Uttarakhand found that age specific prevalence of hypertension showed that prevalence of hypertension increases with increasing age.

Present study shows the prevalence of hypertension was highest 29.5% (18/61) among study subjects belonging to Class I socioeconomic status followed by 24.7% (76/308) Class II, 19.2% (71/369) Class III, 17% (107/214) Class IV, and 22.4% (48/214) in Class V. Chi-square test for socioeconomic status and hypertension is found to be statistically significant (χ^2=11.845, df=4, p= 0.019). Similar finding was documented by Khadilkar HA et al (2004)[16] in their study conducted in Maharashtra in found that the prevalence of hypertension was significantly higher in upper income socioeconomic status. Soudarssanane MB et al (2006)[17] carried out study at Pondicherry, between March & December 2002. They found significant association between the socioeconomic status and hypertension.

Prevalence of hypertension was high 38.9% (122/314) among subjects with positive family history of hypertension compared to 15.6% (198/1266) among study subjects with negative family history of hypertension. Marianne AB et al (2001)[18] conducted cross sectional study in Gambia in South Africa to examine whether a family history of high-risk groups for major non communicable diseases (NCDs) was a significant risk factor for these conditions among family members in a study population. They found significant association between family history and hypertension. Mandal PK et al (2010)[19] conducted Cross-sectional observational community based study in an urban community of West Bengal India by house to house visits clinical examination and interview of study population with a pre-designed pre-tested proforma found that family history of hypertension was significantly associated with development of hypertension among the study subjects.

It has been observed that prevalence of hypertension was 32.6% (31/95) among the obese, 29.1% (109/374) among the pre obese, 17.4% (147/847)

among Normal BMI, and 12.5% (33/264) among the underweight subjects. The association between the BMI and the hypertension found statistically significant (χ^2= 41.547; df= 3; p < 0.001). Tambe D B (2010)[20] conducted a clinic based cross-sectional study in private dispensaries and the Department of Physiology of a local medical college, Pune (India). They documented that there is significant correlation between hypertension and BMI. Rajsekar VD et al (2012)[21] conducted community based cross-sectional study in a village under rural service area of Community Medicine Department among 1905 adults, age ≥ 30 years to study the prevalence and risk factors for hypertension in rural area of Tamilnadu, South India. They found significant association between obesity and risk of hypertension.

Among the smokers prevalence of hypertension was found 31.6% (48/152) and 68.4% were found Normotensive. While among non smokers the prevalence of hypertension found 19.0% (272/1428) and 81.0% (1156/1428) found Normotensive. The relation between smoking and hypertension was found significant on statistical analysis (χ^2= 13.357; df=1; p< 0.001). Reddy SS and Prabhu GR (2005)[22] A cross sectional community based study was conducted to find out the prevalence of hypertension and its various risk factors as well as the extent of diagnosis and management among adults (20-60 years) of both sexes residing in the Channa Reddy colony (urban slum area) in Tirupati, A.P. They found significant association between smoking and hypertension. Agrawal VK et al (2008)[23] in their study conducted in age group 30 years and above in Maharashtra found that significant association between smoking and hypertension.

The prevalence of hypertension in smokeless tobacco users was 25 % (18/324), and in non-smokeless tobacco users it was 19% (239/1256). The association between smokeless tobacco use and hypertension was statistically significant (χ^2=5.686, df =1, p< 0.05). Hazarika NC et al, (2002)[24] conducted study in Assam found that the habit of khaini (a form of tobacco quid containing a mixture of tobacco and lime) intake with increase the risk of hypertension. Ali SH (2012)[25] carried out study in an urban slum of Chennai, to find out the prevalence of hypertension and diabetes and its association found significant association between hypertension and smokeless tobacco consumption.

It was observed that among the alcoholics 29.5% subjects found to be hypertensive and 70.5% (110/156) were Normotensive while 19.2% (274/1424) were found hypertensive among the non alcoholic and 80.8% (1150/1424) found non hypertensive. The difference was found statistical-

ly significant (χ^2=9.138; df=1; p=0.03). Maheswaran R (1991)[26] examined five hundred and seventy-seven subjects were examined in an occupational screening surveyed for effect of alcohol consumption on blood pressure. They found that recent alcohol consumption was associated with raised systolic and diastolic blood pressure in both men and women. Singh RB et al (2011)[27] conducted a cross sectional study found that subjects with pre hypertension and hypertension are having higher alcohol intake and on multiple logistic regression analysis revealed strong association between alcohol intake and hypertension.

CONCLUSION

In the present study prevalence of hypertension was found to be 20.3% in urban population aged 20-45 years. Statistically significant association was observed between hypertension and age, socioeconomic status, family history of hypertension, obesity, smoking, smokeless tobacco and alcohol consumption.

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