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BURDEN OF HYPERTENSION AND ITS RISK FACTORS IN ALIGARH : ARE WE AWARE AND CONCERNED?

Medical Science

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ABSTRACT

Background: Hypertension is a major public health challenge and in any human population it shows a good deal of inter and intra individual variability. Financial and public health consequences of both hypertension and the failure to control it are enormous. Identification of different risk factors are important for the prevention and control of hypertension. So the present study was undertaken with the following objectives: To find out the prevalence of hypertension among study population and to determine the different risk factors and their association with hypertension Methods: Cross-sectional, observational community based study was conducted in Aligarh, India by house to house visits, clinical examination and interview of study population with a pre-designed pre-tested WHO STEPS proforma.

Result: The prevalence of hypertension was 25.2%. Prevalence was increased with increasing age and it was more among the male(33%).

Discussion: Socio demographic variables age, sex, marital status and , anthropometric index -BMI, dietary factors like consumption of inadequate fruits &vegetables intake of alcohol and tobacco use were found as risk factors of hypertension by binary logistic regression analysis

Conclusion: Considering these risk factors, preventive measures should be undertaken to reduce the burden of hypertension and its consequences.

KEYWORDS

Hypertension, Socio Demographic Variables, Bmi, Dietary Factors

Introduction

Hypertension is the commonest cardiovascular disorder posing a challenge to the societies insocioeconomic and epidemiologic transition(1). As the population ages, the prevalence of hypertension increases. Data emerging from the Framingham Heart study suggested a 90 percent residual lifetime risk of developing hypertension for individuals 55 and older with normal blood pressure(2). Financial and public health consequences of both hypertension and the failure to control it are enormous. In any country in the world including India, with gradual socioeconomic development, control of communicable diseases and increased expectation of life, non-communicable life style related diseases are becoming important. Community-based prevalencestudies on hypertension are being done in India long since. Chopra et al studied this problem in a general population for the first time in India in 1942(3). The number of such studies gradually increased, particularly after Independence in 1947. In any human population it shows a good deal of inter and intra individual variability. Predisposing factors of hypertension differ from country to country and even different places within the country. Due to rapid urbanization and social changes, new factors of hypertension are also emerging. Explorations of these factors are important for prevention and its consequences of hypertension. Community based studies on hypertension and associated risk factors in urban areas are scarce, especially in the eastern parts of India. So the present study was undertaken with the following objectives: To find out the prevalence of hypertension among study population in field practice area of department of community medicine JNMCH Aligarh.To determine the different risk factors and their association with hypertension.

Materials and Methods

Type of Study: Community based cross sectional study.
Sampling Unit: Household
Study Unit: Individual

Study Subjects: Considering the increase in prevalence of risk factors of hypertension in younger age group, it was decided that target population would be consist of subjects in the age group ≥ 18 years. This was in agreement with the recommended targeted population in the WHO STEPS approach too. Only residents of the study areas of UHTC and RHTC were included.

Study period: The study period was one year i.e. from July 2013 to June 2014.

Inclusion Criteria:

1) Individuals aged ≥ 18 years, who are residents of the registered areas of UHTC and RHTC.

2) Those individual who gave consent.

Exclusion Criteria:

1- Individuals aged < 18 years.
2- Pregnant females.
3- Individuals who do not give consent.

Sampling method: Systematic random sampling with probability proportionate to size method (PPS).

Sample Size: The sample size for study was calculated after going through a selection of literature on various studies about hypertension and their risk factors. There exists a vast array of studies on various risk factors related to hypertension but no studies could be found to report prevalence in field practice areas of department of community medicine JNMCH Aligarh A pilot study was done to check validity and pretesting of proforma.

The sample size of 644 was reached through the following considerations:

Sample size calculation: Based on previous review literature, in a study conducted By Yadav s et al prevalence of hypertension was 32.2% in Lucknow. This prevalence of hypertension was used for calculating the sample size in our study.

Using Formula- 4pq/I2
P= Prevalence = 32.2%
q= 100-p= 100-32.2 =67.8%
l= relative error of p
=12% of 32.2
=3.87

Substituting the values: Non-response
= 583+ 10% of 583
= 584 + 58.4
~ 644(approximately)

Now on applying PPS we get the sample to be taken from each of registered areas of RHTC & UHTC

Plan of study:

- A community based on household survey will be conducted in the registered areas of urban and rural health training centers. Out of sample size of 644, nearly 359 was drawn from rural and 285 were drawn from urban areas.
- In each area of study the sample to be drawn from each area was calculated depending upon the proportionate to population

method. In each area of study houses will be selected by systemic random sampling by visiting every "k"th house.

- Sampling interval (k) = Total no of sampling unit in that area/Sample required from that area since the sampling unit was household we divided the number of households in each area by the sample to be drawn from particular area in order to calculate the sampling interval. Sampling interval for RHTC and UHTC were calculated for each area.
- The sample was completed by starting from the entry point of area allotting the lane in numbers, and moving into each lane till the end of the lane.
- After randomly selecting 1st household every kth (k=sampling interval) house was selected.
- If a particular household had no subject of ≥ 18 years age then the adjacent household was taken for study.
- If the household consists of 3 or more than 3 members in the age of ≥ 18 yrs in a single house, then any three randomly selected persons will be interviewed. If the household consist of less than 3 individuals, then all the individuals will be interviewed.
- Informed consent was taken from all the respondents.
- Personal details including the name, age, sex, address, religion, education, & occupation of each person was recorded.
- Social class was determined in accordance with standard of living index (SLI).

- **PHYSICAL MEASURMENT:**
- Weight: It was measured using the weighing machine with the subject wearing light summer clothing.
- Height: It was measured by using the measuring tape by making the subject stand after removing all footwear, with feet together, on a hard smooth horizontal, with his/her heels, calves, buttocks, dorsal spine and head touching the wall. All headgear was removed and height was recorded after flattening the hair.

Body Mass Index (BMI): BMI was calculated by the formula
BMI= Wight in kgs / height in m2
Blood pressure measurements (WHO STEPS-2002)(4)

Prepare the participant by asking him to sit quietly and rest for 15 minutes with his/her legs uncrossed. If physical measurements weight, height, (step2) are done immediately after the behavioural measurements alcohol use ,tobacco use (step1), as recommended, the participant should have already been seated for at least 15 minutes, and the blood pressure measurements can be done immediately after finishing the Step 1 questions.

Three blood pressure measurements should be taken. During data analysis the mean of the second and third readings will be calculated. The participant will rest for three minutes between each of the readings.

Results :

Table 1: Age and Sex- wise distribution of the study population (N=644)

AGE-GROUPS (YEARS)	MALE N (%)	FEMALE N (%)	TOTAL N (%)
18-25	60(20.0%)	69(20.1%)	129(20.0%)
26-35	65(21.7%)	87(25.3%)	152(23.6%)
36-45	65(21.7%)	59(17.2%)	124(19.3%)
46-55	40(13.3%)	102(29.7%)	142(22.0%)
56&ABOVE	70(23.3%)	27(7.7%)	97(15.1%)
TOTAL N (%)	300(46.6%)	344(53.4%)	644(100%)

The majority of the study population was in the age group of 26-35 years of age (23.6%) and 53.4% of the study population was female(Table-I).

Table II: Socio demographic characteristics of the study population (N=644)

CHARACTERISTICS	NUMBER	PERCENTAGE
TYPES OF FAMILY NUCLEAR JOINT	216 428	33.5% 66.5%
RELIGION HINDU MUSLIM	235 409	36.5% 63.5%
MARITAL STATUS MARRIED UNMARRIED WIDOW/DIVORCED	468 173 3	72.7% 26.9% 0.4%
STANDARD OF LIVING LOW MEDIUM HIGH	431 127 86	66.9% 19.7% 13.4%

Table II shows that most of the study population was a member of a joint family (66.5%), Muslim by religion (63.5%) . The marital status revealed that 72.7% were married and 0.4% were widowed, divorced or separated. 66.9% of the study subjects belonged to low SLI where as high SLI comprised only 13.4%.

Table III: Prevalence of hypertension according to age and sex (N=644)

AGE GROUP (YEARS)	MALE		FEMALE	
	HYPERTESIVE	NO-HYPERTENSIVE	HYPERTENSIVE	NO-HYPERTENSIVE
18-25	13(21.7%)	47(78.3%)	9(13%)	60(87%)
26-35	23(35.4%)	42(64.6%)	8(9.2%)	79(90.8%)
36-45	19(29.2%)	46(70.8%)	7(11.9%)	52(88.1%)
46-55	16(40%)	24(60%)	30(29.4%)	72(70.6%)
55&ABOVE	28(40%)	42(60%)	9(33.3%)	18(66.7%)
TOTAL	99(33%)	201(67%)	63(18.3%)	28181.7(%)

The distribution of the study populations by age and sex is presented in Table III and it showed that the prevalence of hypertension was highest (40%) in the age group of 46 or more among the males and it was (33.3%) between 55&above years among the females. In both males and females prevalence of hypertension was increased with increasing age. Among males there was increase in hypertensive cases in younger age group

Table IV: Anthropometric indice and dietary habits (N=644)

CHARACTERISTICS	HYPERTENSION PRESENT	HYPERTENSION ABSENT
BMI <18.5 18.5-24.99 ≥25	66(48.2%) 72(15.5%) 24(57.2%)	71(51.8%) 393(84.5%) 18(42.8%)
TOBACCO USE YES NO	39(29.5%) 123(24%)	93(70.5%) 389(76%)
ALCOHOL INTAKE YES NO	26(52%) 136(22.9%)	24(48%) 458(77.1%)
FRUIT&VEGETABLE INTAKE YES NO	75(13.5%) 87(100%)	482(86.5%) 0(0%)

Table-IV depicts that prevalence of hypertension was more (57.2%) among those who had BMI (Body Mass Index) 25 or more, where as the proportion of normal blood pressure was more among the persons having BMI less than 25. Prevalence of hypertension was high in persons consuming alcohol (52%), tobacco (29.5%). Regarding dietary consumption it was revealed that proportion of persons having normal pressure were more among the persons who consumed fruits & vegetables (86.5%), although 13.5% percent of hypertensive persons consumed fruits and vegetables daily.

Table V: Association between hypertension and risk factors by binary logistic regression analysis

VARIABLES IN THE EQUATION	B	S.E.	WALD	DF	SIG.	EXP(B)/ OR
AGE GROUP	-.557	.136	16.846	1	.000	.573
SEX	.807	.387	4.348	1	.037	2.242
MARITAL STATUS	.353	.398	.787	1	.375	1.423
RELIGION	2.778	.445	38.941	1	.000	16.086
SLI	-2.721	.392	48.185	1	.000	.066
TOBACCO SMOKING	-4.434	1.203	13.594	1	.000	.012
ALCOHLIC	4.044	1.112	13.232	1	.000	57.033
FRUIT & VEGETABLE INTAKE	-23.696	3404.555	.000	1	.994	.000
BMI	.826	.140	34.656	1	.000	2.283
CONSTANT	26.142	3403.556	.000	1	.994	2.255

Association of study variables with hypertension was analysed by binary logistic regression and reflected in table – V. The socio demographic variables of age, sex, were significantly associated with hypertension. Anthropometric index like BMI, intake of alcohol and tobacco use were also significantly associated with hypertension. Other factors like marital status, intake of fruits & vegetables were also analysed but no associations were found.

Discussion:

The prevalence of hypertension was 25.2% and it was more among the males (33%) in comparison to females (18.3%). Kannan et al (2009) in a study, have reported prevalence of hypertension to be 25.2% (5), while prevalence of 32.2 was reported by Yadav et al (2008) (6), Reddy et al (2006) (7)have reported prevalence of hypertension to be 27.2%. One of the reasons for increasing prevalence of hypertension is that studies from the mid 1950s to late 1990s, considered different criteria for hypertension (BP ≥160 mm Hg systolic and/or ≥95 mm Hg diastolic) and another reason might bedue to changes of social factors and lifestyle habits. High prevalence of hypertension was also reported in many developed countries where it was found that at any given time almost half of individuals had high BP(8). Low prevalence of hypertension (15.5%) among the Greek population was reported by Pitsavos et al(9). Low prevalence was due to the fact that they considered self reported hypertension. In our study an attempt has been made to find out the association between different risk factors with hypertension by binary logistic regression analysis.It was found that that person with higher BMI 57.2% were hypertensive, Prevalence of hypertension was significantly higher among individuals, with high body mass index and increased waist hip ratio, (P<.05).(10). Higher body mass index (BMI) were independent predictors of hypertension in both sexes.(11). Among smokers ,drikers and person taking inadequate fruits &vegetables hypertension was present similarly it was also found in many study like A higher prevalence of smoking (35% vs 30%), was observed in hypertensive against normotensive (12) Various risk factors significantly associated with hypertension like age, sex, BMI, smoking, alcohol, salt intake etc. (13). Insufficient intake of less fruits and vegetables in Indian diets has been argued as the possible explanation of greater prevalence of cardiovascular diseases and diabetes among Indians (14).

Conclusion:

Risk factors of hypertension identified in this study were suggestive and not a causal one as the study was cross sectional. This hypothesis could be explored by future analytical or randomized trials. There may be other factors for hypertension, which were not identified in this study. However the study has some positive findings. The study showed the increased trend of prevalence of hypertension in comparison to earlier studies and different risk factors identified in this study indicates that adoption of westernized life styles and exposure to stress of acculturation and modernization might be the reason for such a phenomenon. Policymakers should develop strategies for the prevention and control of the increasing trend of hypertension considering these findings.

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