Prevalence of Hypertension in Rural South Gujarat and Risk Factors Associated With It

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ABSTRACT

Introduction: Hypertension is one among the main health and development challenges of the 21st century. Prevalence of Hypertension varies in every community. To tackle this important health problem, we need to understand it's prevalence and important factors associated with it. This study was carried out to find out the prevalence of Hypertension in study subjects also to find the risk factors correlated with Hypertension.

Materials and Methods: A Cross-sectional study was administered among 738 individuals of 30 years and above attending Out Patient Department (OPD) in three Primary Health Centre of South Gujarat during June 2019-March 2020. A pretested predesigned questionnaire was used to collect demographic data by interview technique.

Results: Among 738 patients, the prevalence of hypertension was 41.7%; out of this, 28.7% were conscious of their hypertensive status while 13% were newly diagnosed cases. The association between hypertension with increase in age, family history of hypertension, increase salt intake, consuming mixed diet, increase waist circumference, waist hip ratio and body mass index were found significant. Physical inactivity, gender, tobacco and alcohol consumption were not significantly associated with hypertension.

Conclusions: The prevalence of hypertension in country is comparatively high. Extensive efforts are required for raising the notice level & regular screening of high-risk population is suggested for preventing the complications & disability.

Keywords: Screening; Hypertension; Risk factors; Out Patient Department

INTRODUCTION

All nations, rich and poor are affected by the impact of the Hypertension epidemic. Globally, nearly one billion people have high vital sign (hypertension); of these, two-thirds are in developing countries.[1] Hypertension is one of the most important causes of premature death worldwide and the problem is growing; in 2025, an estimated 1.56 billion adults are going to be living with hypertension.[1] Hypertension may be a silent, invisible killer because it often has no warning signs or symptoms, and many people don't realize they need it until the top organ damages have occurred; that's why it's important to get vital sign checked regularly.

Prevalence of Hypertension varies in every community.[2,3] To fight with this important health problem, we need to understand it's prevalence and important factors associated with it. This study was carried out to find out the prevalence of Hypertension in study subjects also to find the risk factors correlated with Hypertension.

MATERIAL AND METHODS

An OPD based cross sectional study was conducted among individuals aged 30 years and above in Rural area of South Gujarat located in western part of India. The study was conducted at three conveniently selected Primary Health Centres during June 2019 to March 2013. Ethical approval for the study was obtained from Institutional ethics panel. An informed consent was taken from the participants after explaining them the aim of this study.

For the study a questionnaire was developed after in-depth literature search and taking help of senior faculties. Questionnaire was initially tested among 20 participants to assess completeness and feasibility. This predesigned, pretested, structured questionnaire was used to obtain demographic data, personal and family history of hypertension, behavioural aspects, including, tobacco use, alcohol use, dietary habits, salt intake and physical activity. Blood pressure (BP) and anthropometric data was recorded.

All patients above 30 year coming to the OPD of selected PHCs during the study period were considered for the study. Individuals of below 30 years or a pregnant female of any age were excluded from the study.

Anthropometric Measurements: Height was measured to the nearest centimetre using a wall mounted measuring tape with the subject standing erect and barefoot. Weight was measured to the closest 0.5 kg using weighing scale. Body Mass Index (BMI) was calculated as weight in kilograms (kg) divided by square of the peak in meter (m^2).

Waist circumference (WC) was measured using a non-stretchable measuring tape. Subjects were asked to stand erect with both feet together. One layer of clothing was accepted. WC was measured at the littlest horizontal girth between the costal margins and the iliac crest. Hip circumference (HC) was measured at the extent of greater trochanters with a topic in standing position & both feet together. Waist to Hip ratio (WHR) was calculated with the corresponding values of waist and hip circumference. Blood pressure (BP) was measured using mercury sphygmomanometer in the sitting posture with an appropriate-sized cuff encircling the arm. Two readings were taken during a resting patient at a 5-minutes interval, and the average of the two readings was reported.

Operational Definitions: Tobacco user was defined as a person who at the time of survey were using tobacco products in any form either daily or occasionally for a minimum of past one year. Alcohol users were those who were consuming alcohol either daily or occasionally for at least past one year. Salt intake was considered as increased if salt was added on top of cooked food, salad, consuming pickles or chutney daily. Vegetarian was defined as those that consume cereals, pulses, vegetables, fruits, nuts, milk and milk products. Mixed diet includes eggs, meat in addition to vegetarian diet.

A person is considered physically active if he does brisk walk daily 30 minutes on most days of the week. According to the BMI individuals were classified into four groups: Underweight (BMI <18.5 kg/m²), Normal (BMI 18.5-22.99 kg/m²), Overweight (BMI 23-24.99 kg/m²) and Obese (BMI ≥25kg/m²). This was according to the BMI classification given by the Steering Committee of the Regional office for Western Pacific Region of WHO, the International Association for Study of Obesity and the International Obesity Task Force proposed the appropriateness of the classification of obesity in Asia in 2000. [3]

Using waist circumference, the cut off point for central obesity was defined as ≥90cm for males & ≥ 80 cm for females as suggested for Asian ethnicity. [4] Using Waist - Hip Ratio, The cut off point for truncal obesity was defined as ≥0.9 for males & ≥ 0.8 for females as suggested for Asian ethnicity. [4]

Blood Pressure was classified into four stages: Normal (SBP <120 mmHg and DBP <80 mmHg respectively), Pre - hypertension (SBP=120 - 139 and/or DBP= 80 - 89 mmHg), stage I hypertension (SBP=140 - 159 and/ or DBP=90 - 99 mmHg) and stage II hypertension (SBP= ≥160 and /or ≥ 100 mmHg) as per US Seventh Joint National Committee on Detection, Evaluation & Treatment of Hypertension (JNC VII) criteria.[5] Individuals with history of hypertension and on antihypertensive treatment were also labelled as hypertensive.

Statistical Analysis: Data was compiled, entered & analyzed using Microsoft excel and SPSS version 20. The chi square test was used for evaluating statistical significance of association between those were hypertensive and those who were not. A two - tailed p value less than 0.05 was considered significant.

RESULTS

369 participants aged 30 years and above attending OPD of RHTC of Department of community Medicine were included in the study and among these 52.04% were females. Majority of the participants were between 50 - 59 years of age (28.99%) and 96.21% belonged to Hindu community. Nearly three - fourth of respondents were from joint families (71.82 %) and 87% were married. One - fourth (24.9%) of the participants were illiterate, 30% had secondary level, 35% had higher secondary level and 10% had graduate or above level education respectively [Table 1].

Prevalence of Pre - hypertension and hypertension was 41.73% and 34.9% in study participants respectively. Among the hypertensive 13% were newly diagnosed cases. The greater numbers of males (40. 11%) were pre - hypertensive as compared to females (30.21%) whereas the proportion of hypertensive among males and females was almost same (male – 41.25% and females – 42.19%) [Table 2].

Table 1: Demographic characteristics of the study participants (N=738)

Characteristics of Study Subjects	Number (%)
Age group (years)	
30-39	166 (22.49)
40-49	204 (27.64)
50-59	214 (28.99)
≥60	154 (20.88)
Sex	
Male	354 (47.96)
Female	384 (52.04)
Religion	
Hindu	710 (96.21)
Muslim	8 (1.08)
Sikh	20 (2.71)
Family Type	
Joint	530 (71.82)
Nuclear	208 (28.18)
Marital Status	
Married	642 (86.99)
Unmarried	8 (1.08)
Widow/Widower	88 (11.93)
Educational Status	
Illiterate	184 (24.93)
Primary-Middle	222 (30.08)
High School-Intermediate	258 (34.96)
Graduate& above	74 (10.03)
Occupation	
Housewife	346 (46.88)
Farmer/ Unskilled labour	166 (22.49)
Skilled labour	70 (9.49)
Service/Business	126 (17.07)
Not working	30 (4.07)

Table 2: Distribution of hypertension among the study participants

Blood Pressure Categories	Males (%)	Females (%)	Total (%)
Normal	66 (18.64)	106 (27.6)	172 (23.31)
Pre Hypertension	142 (40.11)	116 (30.21)	258 (34.96)
Hypertension Stage I	96 (27.13)	92 (23.96)	188 (25.47)
Hypertension StageII	50 (14.12)	70 (18.23)	120 (16.26)
Total	354 (100)	384 (100)	738 (100)

According to [table 3], Hypertension was found to be significantly associated with increasing age (Chisquare =12.33), family history of hypertension (Chisquare =6.68), mixed diet (Chisquare =5.87), increased salt intake (Chisquare =12.42), body mass index ≥ 23kg/m 2 (Chisquare =19.75), increased waist circumference (Chisquare =33.50) and increased waist hip ratio (Chisquare =5.80). Association of hypertension was not found to be significant with sex, tobacco use, alcohol use and physical activity.

DISCUSSION

In this study, prevalence of hypertension was 41.7% among patients attending the OPD situated in the rural area. Also, the two OPD based studies[6,7] done previously in the hilly region of Uttarakhand had low prevalence of hypertension than that found in pre-

sent study. The prevalence of hypertension in other parts of rural India ranged from 11.43% to 43.3% as reported in several studies.[6-20] The diverse geographical, cultural and socioeconomic characteristics of the people in this country itself may be some of the reasons for such wide range in prevalence of hypertension. Some variations in prevalence may be due to variations in methodology used in different studies such as difference in hypertension criteria and age groups included. Hypertension was significantly associated with increase in age in our study and the finding was consistent with several studies.[6-20] The prevalence of hypertension in this study was slightly higher among females compared to that in males but the difference was not statistically significant. Similar pattern, were seen in studies done by Parekh et al in Vadodara[14] and Mahmood et al in Bareilly [17] . Kokiwar et al[12] observed female sex having higher prevalence of hypertension as compared to male and thi s difference was significant. In the present study, association of hypertension was statistically significant with family history of hypertension and increasing BMI and similar findings were observed in studies done by Rajasekar et al[13] Saxena et al[16] and Rao et al[20] .

Increased waist circumference was significantly associated with hypertension and the same observation was reported by Rajasekar et al[13] and Rao et al[20]. Increased waist hip ratio was significantly associated with hypertension in this study and the similar observation was reported in study done in Central India (Nagpur) by Kokiwar et al[12]. Increased salt intake and consumption of mixed/ nonvegetarian diet was found to be significantly associated with hypertension in our study and similar observation was found in study by Gupta M et al[10]. Association of increased salt intake and hypertension was also observed in studies done by Ghosh et al[6] and Saxena et al.[16]

Physical inactivity was not found statistically associated with hypertension in this study and the similar findings was observed by Rajasekar et al[13] while the studies by Gupta SK et al[7] and Madhu et al[8] had a significant association between sedentary life style and hypertension. In the present study no significant association was observed between hypertension and consumption of tobacco and alcohol whereas in studies done by Gupta SK et al[7], Rajasekar et al[13] and Saxena et al [16] tobacco smoking and alcohol consumption were significantly associated with hypertension. This may be because of variations in consumptions of tobacco and alcohol among males and females as none of the females in our study reported using tobacco and alcohol. Intake of alcohol was occasionally i.e. in months according to subjects.

LIMITATIONS

It was an OPD based study involving small sample size; results cannot be generalized to entire population.

Tables 3: Association of risk factors and hypertension

Variables	Hypertension		χ^2 Value
	Present (N=308) (%)	Absent (N=430) (%)	
Age (years)			
30-39	44 (14.29)	122 (28.37)	12.33*
40-49	84 (27.27)	120 (27.91)	
50-59	100 (32.47)	114 (26.51)	
≥60	80 (25.97)	74 (17.21)	
Sex			
Male	146 (47.4)	208 (48.37)	0.03
Female	162 (52.6)	222 (51.63)	
Family H/o HTN			
Present	116 (37.66)	108 (25.12)	6.68*
Absent	192 (62.34)	322 (74.88)	
Salt intake			
Normal	150 (48.7)	288 (66.98)	12.42*
Increased	158 (51.3)	142 (33.02)	
Body Mass Index			
Normal	66 (21.43)	188 (43.72)	19.75*
Overweight/obese	242 (78.57)	242 (56.28)	
Waist Circumference			
Normal	80 (25.97)	242 (56.28)	33.50*
Central obesity	228 (74.03)	188 (43.72)	
Waist Hip Ratio			
Normal	54 (17.53)	122 (28.37)	5.80*
Increased	254 (82.47)	308 (71.63)	
Physical Activity			
Present	104 (33.77)	154 (35.81)	0.16
Absent	204 (66.23)	276 (64.19)	
Tobacco use			
Present	66 (21.43)	116 (26.98)	1.48
Absent	242 (78.57)	314 (73.02)	
Alcohol use			
Present	70 (22.73)	96 (22.33)	0
Absent	238 (77.27)	334 (77.67)	
Dietary Habits			
Mixed	158 (51.3)	166 (38.6)	5.87*
Vegetarian	150 (48.7)	264 (61.4)	

*Chi-square is significant for $p<0.05$

Over estimation of the prevalence of hypertension could be there because of white coat hypertension and the stress factor, which could not be evaluated.

CONCLUSION

In this study, the prevalence for hypertension in OPD attendees of PHCs was relatively high pointing towards higher prevalence in this rural community. The significant association was observed with various risk factors such as age, family history of hypertension, dietary habits, salt intake, and obesity. Except age and genetic predisposition other risk factors are modifiable. Thus, extensive efforts directed towards raising the awareness level regarding lifestyle modifications would be helpful in reducing the burden of hypertension. The routine screening of patients aged 30 years and above attending the primary health centre will facilitate early detection of hypertension and preventing the complications and chronic disability resulting from it.

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