RESEARCH ARTICLE

STUDY OF PREHYPERTENSION & HYPERTENSION IN RURAL AREA OF VADODARA DISTRICT

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ABSTRACT

Background: Hypertension is an important public health problem worldwide and is the most widely recognized modifiable risk factor for cardiovascular disease, cerebrovascular disease (stroke) and end-stage renal disease.

Aims & Objective: This study is to assess the prevalence of prehypertension and hypertension in rural Vadodara.

Material and Methods: A planned pretested schedule was used to collect data regarding demographic characteristics and blood pressure pattern. The cross-sectional study involved a survey of 260 individuals residing in rural areas of District Vadodara. Chi- square test and ANOVA were used to analyze data.

Results: The proportion of hypertension showed an increasing trend with age. The prevalence of prehypertension was 24.2% and hypertension was 20.4%. The mean systolic as well as diastolic blood pressure patterns were found to be higher with the increase in age. Insignificant differences were found with gender.

Conclusion: Early detection of hypertension can be facilitated by periodic screening of the people regularly. The prevalence of prehypertension and hypertension was found to be high in rural area of Vadodara District.

KEY-WORDS: Evaluation; Prehypertension; Hypertension; Screening

Introduction

Hypertension is an important public health problem worldwide and is the most widely recognized modifiable risk factor for cardiovascular disease, cerebrovascular disease (stroke) and end-stage renal disease.[1,2] Worldwide, prevalence estimates for hypertension may be as much as one billion individuals per year, and approximately 7.1 million deaths per year may be attributable to it.[3]

Obesity is a major independent risk factor for hypertension.[4] The performance of different anthropometric measurements and indices in predicting obesity-related outcomes has been addressed in several reports.[5-7] There is, however, controversy regarding which anthropometric indicator best defines obesity and conveys the highest risk of hypertension5. Cross-sectional and prospective epidemiological studies have shown that blood pressure (BP) and, worse still, hypertension increases significantly with higher body mass index (BMI) and waist circumference (WC).[6,7]

Hypertension is also positively associated with a cluster of risk factors characteristic of the metabolic syndrome, of which overweight/central obesity could be the cornerstone. Indeed it is recommended that management of arterial hypertension should focus both on lowering high BP and correcting associated lipid disorders.[8] The present study was therefore undertaken to determine and evaluate the overweight/obesity and hyperlipidemia status in a group of hypertensive adults.

Materials and Methods

This cross-sectional study was carried out amongst individuals aged 21 years and above residing rural area of District Vadodara. This study was conducted between 1st Feb 2010 to 31st April 2010. A total of 260 individuals gave consent and participated in the study. A planned pretested schedule was used to collect data regarding socio-demographic characteristics (age, gender, religion and socioeconomic status) and blood pressure pattern. Modified Prasad's classification was

applied to measure the individual's socioeconomic status.[9]

In this study, BP measurements were performed by specially trained and experienced healthcare workers. Sitting BP was measured after 10 minutes of rest with a standard adult sphygmomanometer at the beginning of the interview and again at the end. The mean BP value was used for analysis. Blood pressure was graded as normal (SBP <120 and DBP <80 mmHg), pre-hypertension (SBP = 120-139 and/or DBP = 80-89 mmHg) and stage I hypertension (SBP = 140-159 and/or DBP = 90-99 mmHg) as per US Seventh Joint National Committee on Detection, Evaluation & Treatment of Hypertension (JNC VII) criteria.[10]

Statistical Analysis

Considering the prevalence rate of hypertension approximately 20% from a prior study. The sample size was calculated. The following formula was used: Sample size = $4PQ/L^2$. Where, P is Prevalence = 16%, Q = 100 – P = 84% and L is absolute error= 5%. Sample size came out to be 215. A total of 260 individuals gave consent and participated in the study. Ethical approval for the study was obtained from the institutional ethical committee. Data entry and statistical analysis were performed using the Microsoft Excel and Statistical Package of Social Sciences (SPSS) windows version 14.0 software. Tests of significance like Pearson's Chi- square test, Student's t test and ANOVA were applied to find out the results. A two tailed p value < 0.05 was taken for statistical significance.

Results

Majority of respondents were aged more than 40 years of age (65.8%) and were males (60.0%). All of the respondents belonged to lower socioeconomic class applying Modified Prasad's classification.

As per JNC VII criteria, 144 (55.4%) respondents were normotensives, 63 (24.2%) respondents were found to be pre-hypertensive while 53 (20.4%) respondents were in stage I of hypertension respectively, (p value <0.05). (Figure 1)

Figure-1: Gender wise Distribution of Respondents according to Blood Pressures as per JNC-VII Criteria

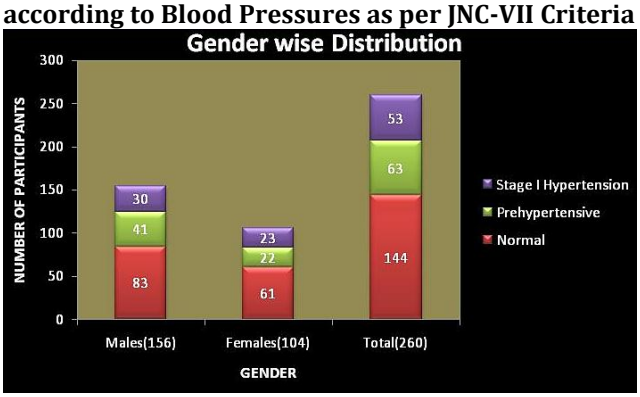

Table-1: Distribution of Hypertensive according to Mean Systolic & Diastolic Blood Pressure

Gender	Total	Hypertensive (%)	Mean SBP in mmHg (Mean ± SD)	Mean DBP in mmHg (Mean ± SD)
Males	156	30 (19.2)	126.3 ± 11.6	76.5 ± 8.9
Females	104	23 (22.1)	128.6 ± 14.2	78.1 ± 10.3
Total	260	53 (20.4)	127.2 ± 13.8	77.4 ± 9.4

Table-2: Age wise Distribution of Individuals with Hypertension

Age Group (Years)	Total	Hypertensive (%)	Mean SBP in mmHg (Mean ± SD)	Mean DBP in mmHg (Mean ± SD)
21-30	42	8 (19.0)	117.9 ± 11.2	74.9 ± 8.4
31-40	47	10 (21.3)	121.2 ± 11.8	75.2 ± 11.3
41-50	53	9 (17.0)	123.1 ± 12.3	77.9 ± 8.1
51-60	55	12 (21.8)	129.3 ± 14.5	78.1 ± 9.5
>60	63	14 (22.2)	131.7 ± 16.4	79.3 ± 9.7
Total	260	53 (20.4)	127.2 ± 13.8	77.4 ± 9.4

The proportion of hypertension (22.1%) was found to be slightly higher among females as compared to that in males (19.2%), the difference being statistically insignificant. The Mean SBP and DBP observed in men was 126.3 ± 11.6/76.5 ± 8.9 mm Hg and in women 128.6 ± 14.2/78.1 ± 10.3 mmHg respectively, the difference being statistically insignificant (p=0.57>0.05) (Table 1).

Overall 20.4% respondents were found hypertensive. The overall, mean blood pressures were 127.2 ± 13.8/77.4 ± 9.4 mm Hg respectively. The proportion of hypertension showed an increasing trend with the increase in age. The Mean SBP and DBP also showed an increasing trend with age (p = 0.24 >0.05) (Table 2).

Discussion

The prevalence of hypertension in India is reported as ranging from 10 to 30.9 %.[12] The average prevalence of hypertension in India is

25% in urban and 10% in rural inhabitants. The prevalence of hypertension has increased during the last decade. The high prevalence of prehypertension (24.2%) and hypertension (20.4%) in the current study, confirms this increasing trend. Rapid urbanization, lifestyle changes, dietary changes and increased life expectancy are factors attributable to this rising trend. The proportion of hypertension was slightly higher among females compared to that in males but the difference was not statistically significant. In contrast greater proportion of hypertension was observed among males (42.9%) as compared to females (34.2%) among rural population of Davanagere.[13] The proportions of hypertension as well as mean systolic and diastolic blood pressures were found to increase steadily with the increase in age. These findings are coherent with those reported in the study conducted among urban and rural adults of Lucknow.[14] Such changes of blood pressure with age might be due to changes in vascular system. Cross-sectional surveys, as well as prospective observational cohort studies, have consistently demonstrated a positive relation between age and blood pressure in most populations with diverse geographical, cultural and socioeconomic characteristics.[15] Prevalence of hypertension in this study is compatible to the prevalences reported in previous studies.[16,17] Similar prevalence of prehypertension (24.5%) has also been reported in the study by Bhardwaj et al (2010) carried in adult population of rural areas of Himachal Pradesh.[18] Prevalence of pre hypertension was also found to be high (18.8%) in a rural community of central India.[19]

Limitation

A major limitation of the study was based on measurement of blood pressure on a single record and was not repeated again for functional reasons.

Conclusion

This study projects the requirement of primitive detection of hypertension which can be facilitated by periodic screening of the people regularly at hospital as well as community level. Prevalence of Prehypertension and Hypertension was found to be substantially prevalent in rural area of Vadodara District. Guidance of the pre-hypertensives on lifestyle modification and its role in controlling hypertension should also be emphasized.

References

1. Fuchs FD, Gus M, Moreira LB, Moraes RS, Wiehe M, Pereira GM, et al. Anthropometric indices and the incidence of hypertension: a comparative analysis. Obes Res 2005; 13: 1515-1517.
2. Erem C, Hacihasanoglu A, Kocak M, Deger O, Topbas M. Prevalence of prehypertension and hypertension and associated risk factors among Turkish adults: Trabzon Hypertension Study. J Public Health 2009; 31: 47-58.
3. World Health Report 2002: Reducing risks, promoting health life. Geneva, Switzerland: World Health Organization. http:// www.who.int/whr/2002/.
4. Nyamdorj R, Qiao Q, So¨ derberg S, Pitka¨ niemi J, Zimmet P, Shaw J, et al. Comparison of body mass index with waist circumference, waist-to hip ratio, and waist-to-stature ratio as a predictor of hypertension incidence in Mauritius. Journal of Hypertension 2008; 26(5): 866-870.
5. Dalton M, Cameron AJ, Zimmet PZ, et al. Waist circumference, waist-hip ratio and body mass Index and their correlation with cardiovascular disease risk factors in Australian adults. J Intern Med. 2003; 254: 555– 563.
6. Williams PT. Increases in Weight and Body Size Increase the Odds for Hypertension During 7 Years of Follow-up. Obesity 2008; 16: 2541–2548.
7. 7. Guagnano MT, Ballone E, Colagrande V, Della Vecchia R, Manigrasso MR, Merlitti D, et al. Large waist circumference and risk of hypertension. International Journal of obesity 2001; 25: 1360-1364.
8. 8. Lepira FB, M'Buyamba-Kabangu JR, Kayembe KP, Nseka MN. Correlates of serum lipids and lipoproteins in Congolese patients with arterial hypertension. Cardiovasc J S Afr 2005; 16(5): 249-255.
9. Agarwal AK. Social classification: The need to update in the present scenario. Indian J Community Med 2008; 33:50-1
10. JNC VII Express: Prevention, detection, evaluation and treatment of high blood pressure. In: http://www.nhlbi.nih.gov/ guidelines /hypertension/express.pdf; 2003. Accessed on 15th November 2009.
11. Mahmood SE, Bhardwaj P, Srivastava JP, Mathur KP, Zaidi ZH, Shaifali I. Sociodemographic risk factors of cardiovascular disease in rural LucknoW 2012;2 (1): 56-61
12. Padmavati S. A meta-analysis-National Heart Institute, New Delhi. Ind Heart J 2002; 54:99-102
13. Yuvaraj BY, Nagendra Gowda MR,1 and Umakantha AG. Prevalence, Awareness, Treatment, and Control of Hypertension in Rural Areas of Davanagere. Indian J Community Med. 2010 January; 35(1): 138–141.

14. Midha T, Idris MZ, Saran RK, Srivastav AK, Singh SK.Prevalence and determinants of hypertension in the urban and rural population of a north Indian district. East Afr J Public Health. 2009 Dec;6(3):268-73.
15. Hypertension control. Technical Report Series: World Health Organization; 1996. Report No.: 862.
16. Chow C, Cardona M, Raju PK, Iyengar S, Sukumar A, Raju R, Colman S, Madhav P, Raju R, Reddy KS, Celermajer D, Neal B. Cardiovascular disease and risk factors among 345 adults in rural India—the Andhra Pradesh Rural Health Initiative. Int J Cardiol. 2007; 116(2): 180–5.
17. Kokiwar PR, Rao JG, Shafee MD. Prevalence of Coronary risk factors in a rural community of Andhra Pradesh. Indian J of Public Health. 2009; 53(1): 52–54.
18. Bhardwaj R, Kandoria A, Marwah R, Vaidya P, Singh B, Dhiman P, Sharma A. Prevalence, Awareness and Control of Hypertension in Rural Communities of Himachal Pradesh JAPI 2010;58:423-25.
19. Kokiwar PR, Gupta SS, Durge PM. Prevalence of Hypertension in a Rural Community of Central India. J A P I 2012;60:26-29.

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