



A STUDY OF PREVALENCE OF HYPERTENSION AND PRE HYPERTENSION AND ITS ASSOCIATED RISK FACTORS IN RURAL AREA OF MADHYA PRADESH

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ABSTRACT

Introduction: As it is hidden beneath an outwardly asymptomatic appearance, the disease does immense harm to the body in the form of 'Target Organ' damage; hence the WHO has named it the 'Silent Killer'. A majority of the rural population in India have inadequate access to healthcare. Clinic-based (Opportunistic) screening of hypertension will not screen and detect a large proportion of adult hypertensives. Objective of the study was to find out the prevalence of hypertension and various risk factors associated with hypertension in the rural area.

Methodology: It was a community based cross sectional study in rural area.

Observation: Majority of (44.4%) individuals belongs to 30-40 years of age in the study group, most of participants in the study were illiterate 56.6 %, majority of respondents belong to middle socio-economic class 32.6% .Prevalence of pre-hypertension and hypertension among studied population were 40.8% & 14.2% respectively, hypertensive's & pre-hypertensive's shows no significant relationship between smoking but significant relationship found between the amounts of alcohol consumption with hypertension. The significant relationship was observed between their socio economic status with hypertensive and pre hypertensive.

Conclusions: There is a high prevalence of pre- hypertension in rural area of Bhopal, this group required more attention to prevent further development of disease and its complication.

Key words: Hypertension, Pre hypertension, prevalence, rural area, Risk factors.

BACKGROUND

The WHO has named hypertension as the 'Silent Killer'. It is a major contributor to cardiovascular

morbidity and mortality in the world including India. Hypertension is one of the most common cardiovascular diseases with a prevalence ranging from 10 to 20% among adult population ¹. It

is the most prevalent cardiovascular disease risk factor worldwide. ²⁻⁴. many studies on hypertension worldwide have been on middle aged and elderly patients giving the impression that hypertension is a disease of those age groups ⁵⁻⁷.

Adolescents with high blood pressure have a significantly greater clustering effect of metabolic syndrome factors when compared to adolescents with low blood pressure⁸. Identifying children and adolescents at risk is the first step in preventing the disease and its risk factors which include cigarette smoking alcohol intake physical inactivity, obesity, steroid abuse family history of hypertension, low birth weight hypercholesterolemia, hyperinsulinaemia, homocystinaemia and poor nutrition ⁹.

The two well-planned studies which screened all persons aged 20-60 years and followed WHO suggested criteria for diagnosis ¹⁰. The one in Rohtak is taken to represent the urban population ¹¹, and the other in a village in Haryana to represent rural population in India ¹². The prevalence of hypertension was 59.9 and 69.9 per 1000 in males and females respectively in the urban population, and 35.5 and 35.9 per 1000 in males and females respectively in the rural population.

Objectives of the study was to find out the prevalence of hypertension and to access various risk factors associated with hypertension in the rural area.

METHOD

A Community based cross sectional study was carried out in catering area of Rural health and training center of Community Medicine department of Peoples College of Medical Sciences and research centre, the sample were selected by systemic random sampling, first house was selected by using currency note, after that every fifth house was selected till the 150th houses were completed, if the selected house found lock in consecutive two visits than next nearby house was taken as a sample. The all adults above the 30 years of age present in selected house were taken as a sample for the study.

Inclusion criteria: Those who above 30 years of age, presented on date of survey, willing to participate, not seriously ill and not on antihypertensive medication.

Exclusion criteria: Less than 30 years of age, ab-

sent on date of survey, seriously ill, not willing, on medication for BP

A total of 600 adults were taken as a sample size, with the reference of prevalence of hypertension 40% and 10% allowable error that calculated by statistical formula and came to be 600, information was collected by using predesigned and pretested proformas during the period of November 2013 to February 2014 with the help of interns and staffs¹³.

The mercury sphygmomanometers of Diamond Company were used for measuring of blood pressure. The blood pressure were measured in a sitting position, three consecutive reading were recorded and lower one considered for diagnosis, WHO criteria was applied to person label as a hypertensive or pre-hypertensive. 1) SBP \geq 140 and/or DBP \geq 90 mmHg. For hypertension 2) 130-139 SBP and 85-80 DBP for pre-hypertension, other risk factors were also observed and recorded in predesigned and pretested proformas.¹⁴⁻¹⁵

Data were analysed using SPSS-19 and presented in the form of tables and graphs, appropriate statistical test also applied with the help of experts.

RESULTS

Majority of (44.4%) individuals belongs to 30-40 years of age in the study group, most of participants in the study were illiterate 56.6 %, majority of respondents belong to middle socio-economic class 32.6%, in study group one third of respondents according to their occupation were housewife 35.2% followed by labourer 30.2%. Prevalence of pre-hypertension and hypertension among studied population were 40.8% &14.2% respectively, Male were reported little higher prevalence than female, illiterate had highest prevalence of pre-hypertension and hypertension according to their educational status. According to socioeconomic status higher prevalence of pre-hypertension and hypertension reported among middle and lower middle class. Hypertensive's & pre-hypertensive's shows no significant relationship between smokings but significant relationship found between the amounts of alcohol consumption with hypertension. The significant relationship was observed between their socio economic status with hypertensive and pre hypertensive.

Table 1: Distribution of respondents according to their socio-demographic profile

Variables	Normotensive n=269 (%)	Pre-hypertensive n=245(%)	Hypertensive n=86(%)	Chi square, df	P value
Age group in years					
30-40	120(44.60%)	109(44.48%)	37(43.02%)	0.15,df=6	p=0.394
41-50	53(19.70%)	48(19.59%)	18(20.93%)		
51-60	36(13.38%)	33(13.46%)	11(12.79%)		
>60	60(22.30%)	55 (22.44%)	20(23.25%)		
Sex					
Male	137 (50.92%)	132(53.87%)	46(53.48%)	0.486,df=2	p=0.784
Female	132(49.07%)	113(46.12%)	40(46.51%)		
Education					
Illiterate	128 (47.58%)	159(64.89%)	53(61.62%)	30.9,df =10	p=0.001
Primary	54(20.07%)	43(17.55%)	19(22.09%)		
Middle	52(19.33%)	20(8.16%)	11(12.79%)		
High school	22(8.17%)	12(4.89%)	3(3.48%)		
Higher sec.	7(2.60%)	2(0.81%)	0(0.00%)		
Graduate & Above	6(2.23%)	9(3.67%)	0(0.00%)		
Socio economic status					
>2713	11(4.08%)	19(7.75%)	7(8.13%)	41.1,df=8	p = 0.00
1344-2713	27 (10.03%)	31(12.65%)	13(15.11%)		
795-1343	77(28.62%)	78(31.83%)	41(41.67%)		
412-794	102(37.91%)	48(19.59%)	15(17.44%)		
<411	52(19.33%)	69(28.16%)	10(11.60%)		
Occupation					
Student	3 (1.11%)	0(0%)	0(0%)	71.4,df=14	p = 0
Housewife	87(32.34%)	96(39.18%)	29(33.72%)		
Agriculture	63(23.42%)	60(24.48%)	14(16.27%)		
Laborer	83(30.85%)	78(31.82%)	20(23.25%)		
Service	6(2.23%)	5(2.04%)	4(4.65%)		
Business	9(3.34%)	5(2.04%)	17(19.76%)		
Retired	1(0.37%)	1(0.40%)	1(1.16%)		
Others	17(6.31%)	0(0%)	1(1.16%)		

Table 2: Distribution according to risk factors

Variables	Pre hypertensive n=245 (%)	Hypertensive n=86 (%)	χ2 Value	P Value
Smoking (in years)				
< 3 yr.	9 (10.70%)	24 (10%)	1.58	p=0.45
> 3 yr.	15 (17.90%)	74 (30%)		
Not Smoking	62 (71.40%)	147 (60%)		
Amount of alcohol consumed				
< 30	15 (6.20%)	9 (10.8%)	9.99	p =0.09
30 – 60 ml.	9 (3.80%)	6 (7.10%)		
> 60 ml.	6 (2.50%)	15 (17.90%)		
Not drinking alc.	215 (87.50%)	56 (64.20%)		
B.M.I				
Overweight + Pre obese	16 (17.9%)	65 (26.3%)	1.21	p=0.546
Obese I+II+III	9 (10.7%)	15 (6.2%)		
Underweight + Normal	61 (71.4%)	165 (67.5%)		
W/H Ratio-MALE				
<1	30(35%)	98 (40%)	0.563	p=0.335
>1	16 (17.8%)	34 (13.8%)		
W/H Ratio FEMALE				
<0.85	25 (28.6%)	46 (18.8%)	1.71	p=0.191
>0.85	15 (17.9%)	67 (27.4%)		
Socioeconomic status				
Upper class	24 (28.5%)	12 (5%)	11.7	p=0.003
Middle class	43 (50%)	159 (65%)		
Lower Class	19 (21.5%)	74 (30%)		

DISCUSSION

The prevalence of hypertension has increased during the last decade. The high prevalence of pre hypertension (40.80%) and hypertension (14.20%) in this study, confirms this increasing trend. Rapid urbanization, lifestyle changes, dietary changes and increased life expectancy are factors attributable to this rising trend¹⁶. High prevalence of pre hypertension observed in this study was similar to that reported elsewhere in India, Andhra Pradesh¹⁷ (30.1% had pre hypertension 7.75% had hypertension), Central India¹⁸ (Pre hypertensive were 27.2% and 27.4% hypertensive's) and Kerala¹⁹ (Overall prevalence of hypertension was 29.8%). The proportion of pre-hypertension was higher among males (53.87%) compared to that in females (46.12%). This concurs with the observation made by previous study that males (42.9%) had higher pre-hypertensive values when compared to females (34.2%) among rural population of Davanagere²⁰. There is similar trend of hypertensive in both the studies. In current study hypertensive males (53.48%) are more in number than females (46.51%), which corresponds to study of Davanagere (i.e. 19.1% male hypertensive and 17.5% female hypertensive)²¹. 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 characteristics²².

Findings from the current investigation must be considered within the context of the study's limitations. Specifically, according to the guidelines set by the World Health Organization. Hypertension should be assessed based on the average of ≥ 2 BP readings taken at ≥ 2 visits after an initial screening. Furthermore, the co-variants for example, diet, anxiety and depression, which may have effects on these associations, were not included in this survey.

This study on Pre hypertension prevalence among young adult population warns and makes aware about possible cardiovascular risks²⁵.

CONCLUSION

The prevalence of pre hypertension was higher among studied population; these people are more prone to land up with hypertension in later period of life, so this group required more attention for prevention of complication and healthy

life style with cessation of smoking and drinking.

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REFERENCES

1. The world health report, reducing risks and promoting healthy life. Geneva Switzerland: World Health Organization; 2002.
2. Lurbe E, Torro I, Alvarez V, Nawort T, Paya R, Redon J, Steessen AJ: Prevalence of persistence, and clinical significance of masked hypertension in youth 2005, 45:493-98.
3. Ejike C, Ugwu C: Hyperbolic relationship between blood pressure and body mass index in a Nigerian adolescent population. *Webmed Cent Hypertension* 2010, 1:797.
4. Jackson LV, Thalange NK, Cole T: J. Blood pressure centiles for great Britain. *Arch Dis Child* 2007, 92:298-303.
5. Shyam SG, Mohammed AA, Kamlech B, Kalyan KD: Prevalence of prehypertension and associated cardiovascular profiles among pre-diabetic Oman adults. *BMC Pub Hlth* 2008, 8:108.
6. Onwubere BJC, Ike SO: Prevalence of hypertension and its complications among medical admissions at the University of Nigeria Teaching Hospital Enugu. *Nig J Int Med* 2000, 3:17-20.
7. Adedoyin OT, Ojuawo A, Johnson ABR: Knowledge attitude and perception of adults on childhood hypertension in a rural community in Nigeria. *Nig Postgrad J* 2006, 3:216-19.
8. Bruce ZM, Sanaiko A: Blood pressure in children. In *Hypertension Primer, The Essentials of High blood pressure*, Volume 83. 4th edition. Edited by Izzo JL, Black HR, Sica AD. Philadelphia: Lippincott Williams & Wilkins; 2008:273-275.
9. Samuel G: Cardiovascular risk factors in adolescents. *Curr Treat Options Cardiovasc Med* 2006, 8:269-275.
10. Hansen ML, Gunn PW, Kaelbar DC: Underdiagnosis of hypertension in children and adolescents. *JAMA* 2007, 298:874-879.
11. Juhasz M, Katona E, Settakis G, Paragh G, Molnar C, Fulesdi B, Pall D: Gender related differences in adolescent hypertension and in target organ effects. *J Women Health* 2010, 19:759-765.
12. www.nhlbi.nih.gov/files/docs/guidelines/jnc7full.pdf
13. Robinson S, Brucer M. Range of normal blood pressure: A statistical and clinical study of 11,383 persons. *Arch Int Med*. 1939;64:409-444.
14. Ramachandran A, Snehalatha C, Vijay V, King H. Impact of poverty on the prevalence of diabetes and its complications in urban southern India. *Diabet Med*. 2002 Feb;19(2):130-5
15. WHO (1996). *Techn. Rep. Ser.*, No. 862.

16. Gupta, S.P. et al (1978). *Ind. Heart J.*, 30: 315.
17. Gupta, S.P. et al (1977). *Ind. Heart J.*, 29: 53.
18. Gregory BL, Roseamet TS: Hypertension in children and adolescents. *Am Fam Physician* 2005, 5:1-11.
19. Samuel G: Cardiovascular risk factors in adolescents. *Curr Treat Options Cardiovasc Med* 2006, 8:269-275.
20. Perez MK, Nield LS: When to consider surgery for an obese teen. *Consult Pediatr* 2009, 8:428-431.
21. Hamidu LJ, Okoro EO, Ali MA: Blood pressure profile of Nigerian children. *East Afr Med J* 2000, 77:180-184.
22. Hypertension control. Technical Report Series: World Health Organization; 1996. Report No. 862.
23. Ferguson TS, Younger N, Tulloch-Reid MK, et al. Progression from pre-hypertension to hypertension in a Jamaican cohort: incident hypertension and its predictors. *West Indian Med J* 2010; 59:486-93.
24. Arima H, Murakami Y, Lam TH, et al. Effects of pre-hypertension and hypertension subtype on cardiovascular disease in the Asia-Pacific Region. *Hypertension*. 2012; 59:1118-23.
25. Liszka HA, Mainous AG, 3rd, King DE, et al. Prehypertension and cardiovascular morbidity. *Ann Fam Med*. 2005; 3:294-99.