

Prevalence and Risk Factors of Hypertension and Prehypertension among Young Adults

D K Hari Babu¹, N. Ganesh²

¹Assistant Professor, General Medicine, RVM Institute of Medical Sciences and Research Centre, Telangana, ²Assistant Professor, General Medicine, RVM Institute of Medical Sciences and Research Centre, Telangana, India

Corresponding author: Dr N. Ganesh, Assistant Professor, General medicine, RVM Institute of Medical Sciences and Research Centre, Telangana, India

DOI: <http://dx.doi.org/10.21276/ijcmsr.2020.5.3.23>

How to cite this article: D K Hari Babu, N. Ganesh. Prevalence and risk factors of hypertension and prehypertension among young adults. *International Journal of Contemporary Medicine Surgery and Radiology*. 2020;5(3):C89-C92.

A B S T R A C T

Introduction: Hypertension is one of the main risk factors for cardiovascular diseases such as stroke, myocardial infarction, kidney diseases and premature mortality. There has been a significant increase in the incidence of hypertension and prehypertension due to the increase in urbanization and economic development, which has led to more tensions and stress, aging population and change in the lifestyle and diet. The rates of prehypertension in the young adults varies with different geographical areas and hence this study was taken to assess the prevalence of prehypertension among the young adults in our area.

Material and methods: This cross-sectional study was done on 1783 patients between the ages 18 – 39 years who had come to our OPD for various ailments and who were unaware of their blood pressure status. Medical examination was done with blood pressure taken twice in 10-minute interval, and blood was collected for biochemical tests such as lipid profile and random blood sugar.

Results: 12.7% of the patients had elevated blood pressure with 4.3% having established hypertension and 8.5% having prehypertension. Over 90% of the patients with hypertension were overweight or obese, while it was around 82% for prehypertensive patients. A total of 178 patients out of 228 (79.1%), who had elevated blood pressure had either their mother or father with hypertension. Around 80% of these patients were either smokers or had alcohol on a regular basis or both.

Conclusion: Early detection is of utmost importance so that treatment can be started at the earliest resulting in reduction in morbidity and mortality. Health education in the community is important to bring about the awareness of hypertension and its risk factors in the younger generation.

Keywords: Hypertension, Prehypertension, Young adults, Obesity

INTRODUCTION

Hypertension is one of the main risk factors for cardiovascular diseases such as stroke, myocardial infarction, kidney diseases and premature mortality.^{1,2} 30% of all the global death is due to cardiovascular disease.³ It is one of the major s of death in India also. 52% of the Indians below 70 years of age have died due to CVD, while the rate is 23% in the developing countries.⁴ Due to treatment and control, there has been a decline in the rate of morbidity and mortality among the developed countries. Hence, hypertension is considered to be a modifiable risk factor for CVD.^{5,6}

Of late, more number of the younger generations are complaining of high blood pressure, especially those between 18 -39 years of age and this is attributed to the increase in obesity due to unhealthy diet.^{7,8} High blood pressure and prehypertension among the younger generation predict the future hypertension condition and cardiovascular diseases of the individual⁹. Earlier studies have reported 20% in males

and 15% in females to have hypertension, mainly due to higher obesity rates.^{10,11}

Prehypertension was introduced in the seventh report of Joint National Committee (JNC-7) and is said to be when the systolic blood pressure is 120-139 mmHg and diastole blood pressure is 80-89mmHg. This condition, among youngsters is considered to be a precursor to hypertension in the future, thereby being a risk for CVD and early death.^{12,13} It has been seen that the world wide estimate of prehypertension is upto 30-50%. 90% of the patients with prehypertension have shown to have another risk factor associated with CVD.¹⁴

There has been a significant increase in the incidence of hypertension and prehypertension due to the increase in urbanization and economic development, which has lead to more tensions and stress, aging population and change in the lifestyle and diet.^{15,16} It has been estimated that there would be a rise of deaths due to prehypertension especially in the poor and the developing countries.¹⁷ In India the estimate is

around 45% in males.¹⁸⁻²⁰

The rates of prehypertension in the young adults varies with different geographical areas and hence this study was taken to assess the prevalence of prehypertension among the young adults in our area.

MATERIAL AND METHODS

This cross sectional study was done by the department of General Medicine in RVM institute of Medical sciences and research Centre, Telangana . 1783 patients between the ages 18 – 39 years who had come to our OPD for various ailments were studied over a period of two years. Patients who already had established hypertension and were on drugs were excluded from the study.

This study was cleared by the institutional ethical committee and the nature of the study was explained to the patients for informed consent. Those patients who did not give the consent were also excluded from the study. A thorough demographic details were collected from all the patients and complete physical and medical examination was done on all of them. A history of hypertension in the family was also enquired and noted.

The blood pressure was collected twice from all the patients, while they were in the sitting position, with a 10 minute gap. An average of the two was taken and was considered to be the blood pressure of the patient. A full blood workup was done for all of them, such as Complete blood picture, Hemoglobin estimation, Erythrocyte sedimentation rate, blood glucose test, biochemical tests for Urea and creatinine and lipid levels.

Body mass index was calculated based on the height and weight of the patient. Waist to hip ratio also was measured for all the patients. The results were analyzed using Microsoft Excel in the form of graphs and tables.

RESULTS

Out of the 1783 patients, 228 (12.7%) of them had elevated blood pressure. Out of these 228 patients, 76 (4.3%) had established hypertension i.e with systolic above 139 mmHg and diastolic above 89 mmHg, while 152 (8.5%) had prehypertension (Fig: 1).

There were more number of females than males in the present study. The number of females were 982 (55.1%) and 801 (44.9%) were males (Fig:2)

The mean age of the patients with established hypertension was 32.6 ± 4.6 years and for prehypertension it was 28.8 ± 3.1 . The weight was 62.8 ± 4.4 and 55.6 ± 3.9 kgs for hypertensive and prehypertensive patients. Over 90% of the patients with hypertension were overweight or obese, while it was around 82% for prehypertensive patients. In case of the normal patients, less than 30% of them were overweight or obese. Many of the patients had a family history of hypertension. A total of 178 patients out of 228 (79.1%), who had elevated blood pressure had either their mother or father with hypertension. Around 80% of these patients were either smokers or had alcohol on a regular basis or both (table:1).

The cholesterol and the triglyceride levels for the prehypertensive and the hypertensive patients was elevated. The mean triglyceride levels for the patients with hypertension was 148.3 ± 7.2 mg/dL and for prehypertension it was 145.2 ± 3.9 mg/dL. Patients with hypertension had 201.7 ± 9.4 mg/dL, 110.4 ± 5.3 mg/dL, 33.2 ± 2.9 mg/dL levels of Total cholesterol, LDL and HDL cholesterol respectively while those with prehypertension had 193.5 ± 6.8 mg/dL, 106.8 ± 4.6 mg/dL, 36.7 ± 8.1 mg/dL respectively (Table: 2).

DISCUSSION

High blood pressure in youngsters and its subsequent

	Hypertension (n= 76)	Prehypertension (n=152)	No hypertension (n=1555)
Mean Age (in years)	32.6 ± 4.6	28.8 ± 3.1	26.4 ± 5.2
Weight (in kgs)	62.8 ± 4.4	55.6 ± 3.9	51.3 ± 7.2
Body Mass Index			
Normal	8 (10.5%)	18 (11.8%)	1104 (71%)
Overweight	29 (38.2%)	91 (59.9%)	409 (26.3%)
Obese	39 (51.3%)	43 (28.3%)	42 (2.7%)
Systolic BP (mmHg)	138.9 ± 7.2	130.9 ± 6.9	110.2 ± 4.1
Diastolic (mmHg)	92.3 ± 4.4	88.1 ± 3.1	76.8 ± 6.4
Smoking	34 (44.7%)	102 (67%)	365 (23.5%)
Alcohol consumption	26 (34.2%)	41 (27%)	221 (14.2%)
Family History	49 (64.5%)	129 (84.9%)	168 (10.8%)

Table-1: Details of patients

Parameters	Hypertension (n= 76)	Prehypertension (n=152)	No hypertension (n=1555)
Triglycerides (mg/dL)	148.3 ± 7.2	145.2 ± 3.9	140.6 ± 5.5
LDL (mg/dL)	110.4 ± 5.3	106.8 ± 4.6	101.7 ± 9.1
HDL (mg/dL)	33.2 ± 2.9	36.7 ± 8.1	38.6 ± 6.6
Total Cholesterol (mg/dL)	201.7 ± 9.4	193.5 ± 6.8	186.7 ± 6.5
Random Blood Sugar	112 ± 7.7	101.4 ± 3.8	95.6 ± 4.7

Table-2: Lipid profile and Blood sugar levels

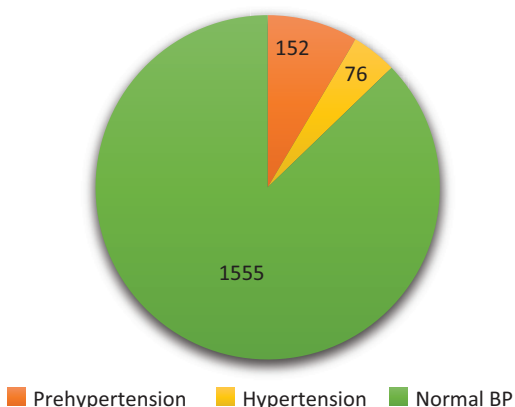


Figure-1: Distribution of prehypertension and hypertension among patients

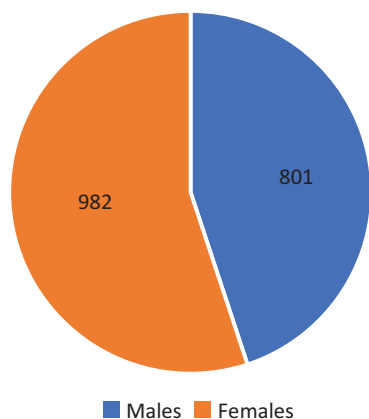


Figure-2: Division of patients based on sex

progression into hypertension has been reported in several studies. Thus, a prehypertensive status in the early ages is a predictor for established hypertension later on.²¹ Hypertension is a global health problem and is very prevalent in India also.^{22,23}

In the present study, the prevalence of prehypertension was 8.5% while 4.3% of the patients had established hypertension. The overall elevated blood pressure levels were seen in 12.7% of the cases.²⁴ Very high cases of prevalence compared to our study were seen in several cases. A study on Chinese population in 2002 found around 18% of prevalence of hypertension in youngsters of ages 15 years and above. In a study by Jayaprasad et al, the prevalence of prehypertension among the young adults was 52.66%, out of which there were more number of females than that of males, corroborating our present study.²⁵

55% of the patients in our study were females and 45% were males, showing a slightly higher trend of hypertension in the female patient. Adeloye et al reported a higher incidence of women with hypertension²⁶, but many studies reported males to be the predominant gender.^{27,28} There was no significant association between the gender and hypertension in our study. Similar results were obtained by a similar study by Jayaprasad et al, who also reported that there was no association between the gender and the presence of hypertension.²⁵ Similar results were observed by Bansal et al and Pawar et al.^{29,30}

More than 50% of the patients who had hypertension in the present study were obese and nearly 40% were overweight.

Among the prehypertensive patients, around 88% of them were either overweight or obese. There have been several studies which associated obesity and hypertension. Sorof and Daniels reported that there is a 3 fold increase in hypertension among obese children compared to those having normal weight.³¹ A study by Muntner et al also concluded that there was a considerable increase in the systolic and diastolic blood pressure among the young, which was attributed to them being overweight.³² Lipowicz et al reported that hypertension was seen more in single persons than in married people.³³ Smoking and alcohol consumption was found to be prominent in the patients with elevated blood pressure. Most of the patients also had a parental history of hypertension. Jayaprasad et al, in their study also found an association between alcohol consumption, smoking, addition of salt and obesity and hypertension.²⁵ Similar results were observed by Gupta et al and Madhu et al.^{34,35} Obesity is known to cause hypertension due to the activation of the sympathetic nervous system causing systemic resistance thereby increasing insulin resistance and vascular dysfunction.

CONCLUSION

We hence conclude that prehypertension is very common among the young adults and is increasing in rate. The risk factors are smoking, alcohol consumption, family history and obesity. Early detection is of utmost importance so that treatment can be started at the earliest resulting in reduction in morbidity and mortality. Moreover, proper health education must be given to the people in the community to create an awareness of hypertension, its association with te lifestyle changes and improper nutrition. Importance of regular checkups, especially in the pesons who have the risk factrs must be emphasized.

REFERENCES

- Rodriguez F., Hicks L. S., Lápez L. Association of acculturation and country of origin with self-reported hypertension and diabetes in a heterogeneous Hispanic population. *BMC Public Health*. 2012;12(1, article no. 768).
- Guwatudde D., Nankya-Mutyoba J., Kalyesubula R., et al. The burden of hypertension in sub-Saharan Africa: A four-country cross sectional study. *BMC Public Health*. 2015;15(1, article no. 2546).
- Alwan A. Global status report on noncommunicable diseases 2010. Geneva: World Health Organization;2011.
- Zafar KS, Ram VS, Kumar M, Gupta M, Kumar S, Verma VK et al. The prevalence of hypertension among young adults in a rural population of North India. *Int J Res Med Sci* 2017;5(1):4869-72.
- Unal B, Critchley JA, Capewell S. Explaining the decline in coronary heart disease mortality in England and Wales between 1981 and 2000. *Circulation*. 2004;109(9):1101-7.
- Ford ES, Ajani UA, Croft JB, Critchley JA, Labarthe DR, Kottke TE, et al. Explaining the decrease in U.S. deaths from coronary disease, 1980–2000. *N Engl J Med*. 2007;356(23):2388-98
- De Venecia T., Lu M., Figueredo V. M. Hypertension in young adults. *Postgraduate Medicine*. 2016;128(2):201–

- 207.
8. Tran CL, Ehrmann BJ, Messer KL, Herreshoff E, Kroeker A, Wickman L, et al. Recent trends in healthcare utilization among children and adolescents with hypertension in the United States. *Hypertension* 2012; 60(6):296–302.
 9. Vasan RS, Massaro JM, Wilson PW, Seshadri S, Wolf PA, Levy D, D'Agostino RB. Antecedent blood pressure and risk of cardiovascular disease: the Framingham Heart Study. *Circulation* 2002; 105(2):48–53
 10. Pimenta E, Oparil S. Prehypertension: epidemiology, consequences and treatment. *Nat Rev Nephrol* (Internet). Nature publishing Group. 2010;6(1):21-30.
 11. Liszka HA, Mainous AG, King DE, Everett CJ, Egan BM. Prehypertension and cardiovascular morbidity. *Ann Med Fam.* 2005;3(4):294-299.
 12. Vasan RS, Larson MG, Leip EP, et al. Impact of high normal blood pressure on the risk of cardiovascular disease. *NEJM.* 2001;345(4):1291–1297
 13. O'Donnell CJ, Ridker PM, Glynn RJ, et al. Hypertension and borderline isolated systolic hypertension: increased risks of cardiovascular disease and mortality in male physicians. *Circulation.* 1997;95(3):1132–1137.
 14. Greenlund KJ, Croft JB, Mensah GA: Prevalence of heart disease and stroke risk factors in persons with prehypertension in the United States, 1999–2000. *Arch Intern Med.* 2004;164(1): 2113-2118.
 15. Elliott WJ, Black HR: Prehypertension. *Nat Clin Pract Cardiovasc Med.* 2007;4(5): 538-548.
 16. Grotto I, Grossman E, Huerta M, Sharabi Y: Prevalence of prehypertension and associated cardiovascular risk profiles among young Israeli adults. *Hypertension.* 2006, 48(2): 254-259.
 17. Alwan A, Maclean DR, Riley LM, d'Espaignet ET, Mathers CD, Stevens GA, et al. Monitoring and surveillance of chronic noncommunicable diseases: progress and capacity in high-burden countries. *Lancet.* 2010;376(9755):1861-8.
 18. National Nutrition Monitoring Bureau (NNMB). Diet and nutritional status of population and prevalence of hypertension among adults in rural areas, NNMB Technical Report 24: Hyderabad: NNMB; 2006. p. 35-7.
 19. Yadav S, Boddula R, Genitta G, Bhatia V, Bansal B, Kongara S, et al. Prevalence & risk factors of prehypertension & hypertension in an affluent north Indian population. *Indian J Med Res* 2008; 128(1): 712-20.
 20. Deepa R, Shanthirani CS, Pradeepa R, Mohan V. Is the 'rule of halves' in hypertension still valid? - Evidence from the Chennai Urban Population study. *J Assoc Physicians India* 2003; 51(5): 153-7.
 21. Bao W, Threefoot SA, Srinivasan SR, Berenson GS. Essential hypertension predicted by tracking of elevated blood pressure from childhood to adulthood: The Bogalusa Heart Study. *Am J Hypertension.* 1995; 8(7):657-665.
 22. Nissien A, Bothig S, Grenroth H, Lopez AD. Hypertension in developing countries. *World Health Stat Q.* 1988;41(7):141-154.
 23. Reddy KS. Hypertension control in developing countries: generic issues. *J Hum Hypertension.* 1996;10(3):33-38.
 24. Department of Disease Control and Prevention, Ministry of Health. Report on chronic diseases in China. Beijing, China: Chinese Centre for Disease Control and Prevention. 2006.
 25. Jayaprasad N, Dagdiya KR. Hypertension- prevalence and risk factors in central India: an adult rural experience. *Indian J of Applied Research.* 2018;8(4):46-48.
 26. rates of hypertension in Africa: a systematic analysis. *PLoS One.* 2014;9(8):e104300.
 27. Saeed AA, Al-Hamdan NA, Bahnassy AA, Abdalla AM, Abbas MA, Abuzaid LZ. Prevalence, awareness, treatment, and control of hypertension among Saudi adult population: a national survey. *Int J Hypertens.* 2011;2011(3):174135.
 28. Alsheikh-Ali AA, Omar MI, Raal FJ, Rashed W, Hamoui O, Kane A, Alami M, Abreu P, Mashhoud WM. Cardiovascular risk factor burden in Africa and the middle east: the Africa middle east cardiovascular epidemiological (ACE) study. *PLoS One.* 2014;9(8):e102830.
 29. Bansal SK, Saxena V, Kandpal SD, Gray WK, Walker RW, Goel D. The prevalence of hypertension and hypertension risk factors in a rural Indian community: A prospective door-to-door study. *J Cardiovasc Dis Res.* 2012;3(2):117-23.
 30. Pawar A, Shinde P, Annie J. Study Of Prevalence Of Hypertension In Rural Population Of Kerala. *Journal Of Evolution Of Medical And Dental Sciences.*2014;1(6):1234-37.
 31. Sorof J, Daniels S. Obesity hypertension in children: a problem of epidemic proportions. *Hypertension.* 2002;40:441–447.
 32. Muntner P, He J, Cutler JA, Wildman RP, Whelton PK. Trends in blood pressure among children and adolescents. *JAMA.* 2004;291(17):2107-2113.
 33. Lipowicz A, Lopuszanska M. Marital differences in blood pressure and the risk of hypertension among polish men. *Eur J Epidemiol.* 2005;20(5):421–7.
 34. Gupta SK, Dixit S, Singh AK, Nagaonkar S, Malik N. Prevalence and Predictors of Hypertension: A cross-sectional study among people coming to a tertiary health care facility in Garhwal-Uttarakhand. *Indian J Community Health.* 2012;24(4):274-9.
 35. Madhu B, Srinath KM, Ashok NC. Hypertension: Prevalence and its Associated Factors in Rural South Indian Population. *Indian J Public Health Res & Development.* 2012;3(4):105-9

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 01-07-2020; **Accepted:** 02-08-2020; **Published online:** 15-09-2020