International Journal of Advanced Community Medicine

E-ISSN: 2616-3594
P-ISSN: 2616-3586
www.comedjournal.com
IJACM 2021; 4(1): 01-04
Received: 01-12-2020
Accepted: 06-01-2021

Dr. Anupama P
Assistant Professor, Department of Community Medicine, Mount Zion Medical College, Chayalode, Adoor, Kerala, India

Dr. Radha Y Aras
Professor, Department of Community Medicine, Yenepoya Medical College, Mangalore, Karnataka, India

Dr. Jeram Parmar
Professor and Head, Department of Community Medicine, Mount Zion Medical College, Chayalode, Adoor, Kerala, India

Dr. Abhay Nirgude
Professor, Department of Community Medicine, Yenepoya Medical College, Mangalore, Karnataka, India

Corresponding Author:
Dr. Anupama P
Assistant Professor, Department of Community Medicine, Mount Zion Medical College, Chayalode, Adoor, Kerala, India

A study on prevalence of hypertension in the rural adult population

Dr. Anupama P, Dr. Radha Y Aras, Dr. Jeram Parmar and Dr. Abhay Nirgude

DOI: https://doi.org/10.33545/comed.2021.v4.i1a.177

Abstract
In industrialized societies, blood pressure increases steadily during the first two decades of life. In children and adolescents, bold pressure is associated with growth and maturation. Blood pressure "tracks" over time in children and between adolescence and young adulthood. In the United States, average systolic blood pressure is higher for men than for women during early adulthood, although among older individuals the age related rate of rise is steeper for women. A pilot study was conducted with a sample size of 60 participants, taking twenty participants from each of the above mentioned villages. The prevalence of hypertension was found to be 9.2% in the pilot study. Based on the pilot study appropriate changes were made in the initial questionnaire and a final questionnaire was prepared and used for the study. In this study, 77.7% of participants with hypertension were in Stage 1 category in this study. It can be inferred that with increasing age there was a higher prevalence of Hypertension. There is a statistically significant association between Age and Blood Pressure status.

Keywords: Prevalence, hypertension, rural adult population

Introduction
Blood pressure levels, the rate of age-related increases in blood pressure and the prevalence of hypertension vary among countries and among subpopulations within a country. Hypertension is present in all populations except for a small number of individuals living in primitive, culturally isolated societies. In industrialized societies, blood pressure increases steadily during the first two decades of life. In children and adolescents, bold pressure is associated with growth and maturation. Blood pressure "tracks" over time in children and between adolescence and young adulthood. In the United States, average systolic blood pressure is higher for men than for women during early adulthood, although among older individuals the age related rate of rise is steeper for women [1]. Consequently, among individuals aged 60 and older, systolic blood pressures of women are higher than those of men. Among adults, diastolic blood pressure also increases progressively with age until 55 years, after which it tends to decease. The consequence is a widening of pulse pressure beyond age 60. The probability that a middle-aged or elderly individual will develop hypertension in his or her lifetime is 90% [2].

The likelihood of hypertension increases with age and among individuals aged > 60 years, the prevalence is 65.4%. Both environmental and genetic factors may contribute to regional and racial variations in blood pressure and hypertension prevalence. Obesity and weight gain are strong, independent risk factors for hypertension. It has been estimated that 60% of hypertensive are > 20% overweight. Among populations, hypertension prevalence is related to dietary NaCl intake, and the age related increase in blood pressure may be augmented by a high Nacl intake. Low dietary intakes of calcium and potassium also may contribute to the risk of hypertension. The urine sodium-to potassium ratio is a stronger correlate of blood pressure than is either sodium or potassium alone. Alcohol consumption, psychological stress and low levels of physical activity also may contribute to hypertension [3].

In 2010, high blood pressure ranked as the leading single risk factor for Global Burden of Disease. Additionally, high blood pressure was one of the five leading risk factors for GBD in all regions with the exception of Oceania, Eastern Sub-Saharan Africa and Western sub-Saharan Africa. In these regions, high blood, pressure ranked as the number 6 risk factor attributable to burden of disease, as assessed by DALYS [4].

Looking back at findings from the 1990 GBD study, the GBD 2010 study identified a shift from communicable diseases in childhood to non-communicable disease in adulthood. This was most notable in South Asia, where a substantial beyond age 60. The probability that a middle-aged or elderly individual will develop hypertension in his or her lifetime is 90% [5].

The likelihood of hypertension increases with age and among individuals aged > 60 years, the prevalence is 65.4%. Both environmental and genetic factors may contribute to regional and racial variations in blood pressure and hypertension prevalence. Obesity and weight gain are strong, independent risk factors for hypertension. It has been estimated that 60% of hypertensive are > 20% overweight. Among populations, hypertension prevalence is related to dietary NaCl intake, and the age related increase in blood pressure may be augmented by a high NaCl intake. Low dietary intakes of calcium and potassium also may contribute to the risk of hypertension. The urine sodium-to – potassium ratio is a stronger correlate of blood pressure than is either sodium or potassium alone. Alcohol consumption, psychological stress and low levels of physical activity also may contribute to hypertension [6].

Methodology

Study design

Cross-sectional study

Sample size estimation

In a South Indian study 60 in which 21% prevalence of hypertension was quoted. Considering the same, the required sample size for this study was determined using the following formula:

$N = 4*p*q/1^2$

Where p = pre-valance = 21%

q = 100-p = 79

1 = allowable error = 15% of p + 15/100 * 21

N = 668.81 = 669

Taking non-response rate = 10%

669 + 10/100*669 = 669 + 67 = 736

Sample size =736

Study participants

Both males and females aged more than or equal to 18 years.

Inclusion criteria

Individuals aged 18 yrs. and above residing in the study area.

Exclusion criteria

- Individuals aged below 18 yrs. residing in the study area.
- Individuals who were not willing to participate in the study.
- Individuals who were not available at the time of visits.
- Pregnancy, severe menta illnesses and those individuals who were bed-ridden.

Validation of tool

For the study tool WHO STEPS Approach was referred for few variables. The final questionnaire was prepared as per different risk factors in an Indian scenario for the rural population. Thus a structured questionnaire was formulated and it was sent for validation to the Community Medicine experts.

Pilot study

A pilot study was conducted with a sample size of 60 participants, taking twenty participants from each of the above mentioned villages. The prevalence of hypertension was found to be 9.2% in the pilot study. Based on the pilot study appropriate changes were made in the initial questionnaire and a final questionnaire was prepared and used for the study.

Results

Table 1: Distribution of study participants according to their age and sex

Serial no	Age (In years)	Sex (N=736)		Total number (%)
		Male number (%)	Female number (%)	
1	<20	25 (7.9)	40 (9.5)	65 (8.5)
2	21-30	75 (23.7)	109 (26.0)	168 (22.8)
3	31-40	75 (23.7)	115 (27.4)	190 (25.8)
4	41-50	81 (25.6)	73 (17.4)	154 (20.9)
5	51-60	52 (16.4)	49 (11.7)	101 (13.7)
6	>60	25 (7.9)	33 (7.9)_	58 (7.9)
	Total	317 (100.0)	419 (100.0)	736 (100.0)

Of the total 736 participants, 317 (43.07%) were males and 419 (56.92%) were females

It can be inferred from the table that 25.8% of the participants were between 31-40 years of age

Table 2: Distribution of participants according to blood pressure status

Serial No.	Blood pressure status	Frequency (N=736)	Percent (100%)
1	Normotensive	568	77.2
2	Pre-hypertensive	81	11.0
3	Hypertensive	87	11.8
	Total	73.6	100.0

In this study, 11.8% were hypertensives and 11% were pre-hypertensives i.e. high risk for hypertension.

Table 3: Distribution of hypertensives according to stages of hypertension

Serial No.	Stages of hypertension	Frequency (N=168)	Percent (100%)
1	Stage 1 hypertension (systolic BP 140-159mm Hg or a diastolic BP 90-99mm Hg)	67	77.01
2	Stage 2 hypertension (systolic BP 160mm Hg or a diastolic BP 100mm Hg)	20	22.99
	Total	87	100.0

In this study, 77.7% of participants with hypertension were in Stage 1 category in this study.

Table 4: Distribution of study participants according to age and blood pressure status

Serial No.	Age (years)	Status of blood pressure (N = 736)			Total
		Normotensive number (%)	Pre-hypertensive Number (%)	Hypertensive number (%)	
1	<20	59 (10.4)	6 (7.4)	0 (0)	65 (8.8)
2	21-30	159 (28.0)	6 (7.4)	3 (3.4)	168 (22.8)
3	31-40	143 (25.2)	32 (39.5)	15 (17.2)	190 (25.8)
4	41-50	115 (20.2)	21 (25.9)	18 (20.7)	154 (20.9)
5	51-60	59 (10.4)	15 (18.5)	27 (31.0)	101 (13.7)
6	>60	33 (5.8)	1 (1.2)	24 (27.6)	58 (7.9)
	Total	568 (100)	81 (100)	87 (100)	736 (100

Person's chi-square test: x2 = 123.824; df = 10, $p< 0.001$

From the above table, it can be inferred that with increasing age there was a higher prevalence of Hypertension. There is a statistically significant association between Age and Blood Pressure status.

Table 5: Distribution of study participants according to gender and blood pressure status

Serial No.	Gender	Blood pressure status (N = 736)			Total
		Normotensive number (%)	Prehypertensive number (%)	Hypertensive number (%)	
1	Male	236 (41.5)	34 (42.0)	47 (54.0)	317 (43.1)
2	Female	332 (58.5)	47 (58.0)	40 (46.0)	419 (56.9)
	Total	568 (100)	81 (100)	87 (100)	73 (100.0)

Fisher's exact test: x2 =4.790. p=0.093

It was found that among hypertensive, 54% were males

Discussion

In this study, majority of the participants were between 21-50yrs of age. This study found increasing age to be an important risk factor for the development of hypertension. (p<0.001).

In a study by Anderson GH [7] it was observed that increased age was associated with a significant increase in the prevalence of hypertension. Franklin SS [8] a population based cohort study in which it was seen that there was a rise in BP from age 30-49 yrs., Pinto E [9] observed that Isolated systolic hypertension is the most prevalent type of hypertension in those aged 50 or over.

James MA *et al.* [10] in his study demonstrated a significant effect of aging on hypertension. Li Y *et al.* [11] described the age-related changes in blood pressure in 1066 women and 978 men, randomly selected from a Chinese population. All subjects showed age-related increases in BP.

Kotchen JM *et al.* [12] observed that blood pressure increases with age in a surgery of a rural population of Kentucky, USA.

A national survey conducted by Saeed A *et al.* [13] among Saudi adult population found age to be a significant risk factor for hypertension. The prevalence of hypertension was 12.9% for the age group 25-39 yrs. which increased to 57.5% for the age group 55-64yrs in his study. Similar results were obtained in a study conducted by Dong GH *et al.* [14] in rural Liaoning province, China. They observed that the prevalence of hypertension increased with increasing age; it was 22.1% for the age group 35-44 yrs. which increased to 60.3% for the age group of > 75yrs. Yuvraj BY *et al.* [15] conducted a study on hypertension in rural areas of Davengere and found increasing age to be a significant risk factor for hypertension.

In this study among hypertensive participants, 54% were males. A study by Kotchen JM *et al.* [12] reported that prevalence of hypertension is more in males as compared to females. This is because during adolescent and middle age, males have a higher blood pressure compared to females. The female hormones estrogen and progesterone have a protective effect on blood pressure. Later in life this difference diminishes mainly because of the post-menopausal changes.

Ekwunife OI *et al.* [16] conducted a study on hypertension in Nigerian population and found that males had a significantly higher blood pressure compared to females. A Study conducted by Wamala JF *et al.* [17] in Uganda found that Odds of males developing hypertension was 1.44 times more than that of females.

Safdar S *et al.* [18] conducted a study on prevalence of hypertension in Karachi and found proportionately more cases of hypertension among male participants over 35 years of age as compared to female participants of the same age. Hypertension was 1.7 times more common among males than females.

Conclusion

The prevalence of hypertension was found to be 11.8% and pre-hypertension was found to be 11.8% respectively.

References

1. Williams PT, Fortmann SP, Terry RB. Associations of Ditary fat, regional adiposity, and blood pressure in men. JAMA 1987;257:3251-56
2. Witteman JC, Willett WC, Stampfer MJ. A prospective study of nutritional factors and hypertension among US women. Circulation 1989;80:1320-27.
3. Gruchow HW, Sobocinski KA, Barboriak JJ. Alcohol, nutrient intake and hypertension in US adults. JAMA 1985;253:1567-70.
4. Joffres MR, Reed DM, Jano K. Relation of Magnesium intake and other dietary factors to blood pressure: the Honolulu Heart study. Am J Clin Nutr 1992;86:1475-84.
5. Soriguer F *et al.* hypertension: is related to the degradation of dietary frying oils. Am J CLin Nutr 2003;78:1092-97.
6. Najafian J, Nushin M. The relation between total daily caloric intake and blood pressure. Indian Heart J 2008;60(2):110-12.
7. Anderson GH. Effect of age on hypertension: analysis

of over 4800 referred hypertensive patients. Saudi J Kidney Dis Transpl 1999, P10286-97.
8. Franklin SS. Aging and hypertension: the assessment of blood pressure indices in predicting coronary heart disease. J Hypertens Suppl 1999;17(5):29-36.
9. Pinto E. Blood pressure and aging. Postgard MedJ 2007;83:109-114.
10. James MA, Tullett J, Hemsley AG, Shore AC. Effects of aging and hypertension on the microcirculation. Hypertension 2006;47:968-74.
11. Li Y, staessen JA, Sheng CS, Huang QF, O'Rourke M, Wang JG. Age dependency of peripheral and central systolic pressures: cross sectional and longitudinal observations in a Chinese population. Hypertension Research 2012;35:115-22.
12. Kotchen JM, McKean HE, Kotchen TA. Blood pressure trends with aging hypertension 1982;4(3):128-34.
13. Saeed A, A1-Hamdan N, Bahnassy A, Abdalla AM, Abbas M, Abuzaid LF. Prevalence, awareness, treatment and control of hypertension among Saudi adult population: A National survey. Int J of hypertension 2011;1:1-8.
14. Dong GH, Sun ZQ, Zhang XZ, Li JJ, Zhang Lq, Li J *et al*. Prevalence, awareness, treatment and control of hypertension in rural Liaoning provide, China, Indian J Med Res 2008;12:122-27.
15. Yuvaraj BY, Gowds NMR, Umakantha AG. Prevalence, Awareness, Treatment and control of hypertension in rural areas of Davengere. Indian J Community Med 2010;35(1):138-41.
16. Ekwunife OI, Udeogaranya, Nwatu IL. Prevalence, awareness, treatment and control of hypertension in a Nigerian population. HEALTH 2010;2(7):731-35.
17. Wamala JF, Karyabakabo Z, Ndungutse D, Guwatudde D. Prevalence and Factors associated with hypertension in Rukungiri District, Uganda: A community based study. African Health Sciences 2009;9(3):152-60.
18. Safdar S, Omar A, Faisal U, Hasan H. Prevalence of hypertension in low income settlement of Karachi, Pakistan. JPMA 2004;54(3):116-20.