

Original Research Article

Analysis of risk factors of hypertension: a cross-sectional study in a rural area

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ABSTRACT

Background: Hypertension (high blood pressure) is when the pressure in your blood vessels is too high (140/90 mmHg or higher). It is common but can be serious if not treated.

Methods: The present study was conducted at medicine department of Adichunchanagiri Institute of Medical Sciences, Mandya from February to July 2023. Total 100 study subjects in the age group of 30–60 years were included by simple random sampling technique in the present study. Pre-designed, pre-tested proforma was used to collect data regarding demographic characteristics and different risk factors i.e. smoking and alcoholism through house-to-house visits.

Results: In the present study the overall prevalence of hypertension was found to be 18%. Similar findings have also been reported in other studies. Comparable prevalence (15%) was found in the study conducted at squatter settlement of Karachi (Pakistan). Similar prevalence of hypertension (16.9%) has also been reported in the study conducted among labour population of Gujarat.

Conclusions: Cardiovascular risk factors and lifestyle behaviors are amenable to modification and may therefore be relevant targets in the prevention of hypertension. For some modifiable risk factors, it is unclear whether they are causally related to hypertension. This study found that, BMI, alcohol dependence, insomnia, and educational level are causal risk factors of hypertension. This improved understanding of the pathophysiology of hypertension can be used to identify additional targets for the prevention of hypertension and its association diseases.

Keywords: Risk factors, Hypertension, Rural area

INTRODUCTION

Hypertension and diabetes mellitus are one among the leading causes of death in the 21st century. Hypertension generally known as high blood pressure, when the pressure in blood vessels is about 140/90 mmHg or higher. Even though it is a common disease but can be serious illness if it is not treated. The causes of hypertension could be primary or secondary.

The primary hypertension or essential hypertension accounts for 90-95% of adult cases develops as a result of environmental or genetic causes and secondary hypertension accounts for 2-10% of cases, includes

numerous etiologies which includes renal, vascular, and endocrine causes. Blood pressure is denoted as, systolic number/diastolic number in mmHg. The first (systolic) number denotes the pressure in blood vessels when the heart contracts or beats. The second (diastolic) number denotes the pressure in the vessels when the heart rests between beats. Hypertension is diagnosed, if the systolic blood pressure is ≥ 140 mmHg and/or the diastolic blood pressure is ≥ 90 mmHg when it is measured on two different days.¹

If lifestyle modifications are inadequate to accomplish the blood pressure control, patients require several antihypertensive agents to achieve adequate BP control.

There are numerous drug options for treating and managing hypertension. Thiazide diuretics, an angiotensin-converting enzyme inhibitor (ACE I)/angiotensin receptor blocker (ARB), or calcium channel blocker (CCB) are the chosen agents in nonblack populations, whereas CCBs or thiazide diuretics are preferred in black hypertensive populations. These approvals do not eliminate the use of ACE inhibitors or ARBs in treatment of black patients, or CCBs or diuretics in non-black persons. The modifiable risk factors include unhealthy food habits (excessive salt consumption, a diet high in saturated fat and trans fats, low intake of fruits and vegetables), reduced physical activity, consumption of tobacco and alcohol, and obesity. Non-modifiable risk factors include a family history of hypertension, age over 65 years and co-existing diseases such as diabetes or kidney disease. Often, most of the patients with hypertension does not show any symptoms. Elevated blood pressures can cause headaches, blurred vision, chest pain and other symptoms.

Monitoring blood pressure is the finest way to know the blood pressure control. If hypertension isn't treated, it can cause other complications including kidney disease, heart disease and stroke.²

The new guidelines were released by World Health Organization (WHO) on the pharmacological treatment of hypertension in adults. The guidelines provide evidence-based recommendations for the initiation of treatment of hypertension, and suggested intervals for follow-up. It also includes target blood pressure to be achieved for Blood pressure control, and details on who in the health-care system, can initiate the treatment.³

To support governments in firming up the prevention and control of cardiovascular disease, in September 2016, the WHO and the United States Centers for Disease Control and Prevention (U.S. CDC) launched the Global Hearts Initiative, which includes the HEARTS technical package. The HEARTS technical package (healthy-lifestyle counselling, evidence-based treatment protocols, access to essential medicines and technology, risk-based management, team-based care, and systems for monitoring) includes six modules to provide a strategic approach to advance cardiovascular health in countries across the world.⁴

Objectives

Objective of the study was analysis of risk factors of hypertension.

METHODS

The present study was conducted at medicine department of Adichunchanagiri Institute of Medical Sciences, Mandya from February to July 2023.

Total 100 study subjects in the age group of 30–60 years were included by simple random sampling technique in the present study. Pre-designed, pre-tested proforma was used to collect data regarding demographic characteristics and different risk factors i.e. smoking and alcoholism through house-to-house visits.

Blood pressure was recorded in the sitting position in the right arm to the nearest 2 mmHg using the mercury sphygmomanometer. Two readings were taken 5 minutes apart and mean of two was taken as the blood pressure. Hypertension was diagnosed based on drug treatment for hypertension or if the blood pressure was greater than 140/90 mmHg – Joint National Committee 7 criteria. Anthropometric measurements including weight, height, waist and hip measurements were obtained using standardized techniques as given below. Height was measured with a tape to the nearest cm. Subjects were requested to stand upright without shoes with their back against the wall, heels together and eyes directed forward. Weight was measured with a traditional spring balance that was kept on a firm horizontal surface. Subjects were asked to wear light clothing and weight was recorded to the nearest 0.5 kg. Body mass index (BMI) was calculated using the formula: weight (kg)/height (m). BMI of equal to or more than 25 was regarded as overweight and lesser than 25 was considered as non-overweight. Percentages, chi-square test and p value were calculated using Epi Info software.

Exclusion criteria

Patients suffering from malignancies were excluded.

RESULTS

In the present study, the male and female ratio is 1:1.27 and most of the cases were belongs to 30 to 39 age group (48%) (Table 1).

Table 1: Demographic profile of cases.

Group	Number (N=100)	Percentage
Age group		
30-39	48	48
40-49	32	32
50-60	20	20
Sex		
Male	44	44
Female	56	56

In the present study, out of 100 cases, 39 cases were suffering from hypertension since many years (Table 2).

In the present study, Tobacco chewing was the most common risk factor (32%) and 37% cases were belonging to overweight with 8% patients were suffering from CHD (Table 3).

Table 2: Non-modifiable risk factors associated with hypertension.

Risk factors	Non-hypertensive (n=61)		Hypertensive (n=39)		Total (N=100)	
	No.	%	No.	%	No.	%
Age						
30-39	40	40	08	08	48	48
40-49	20	20	12	12	32	32
50-60	12	12	08	08	20	20
Sex						
Male	30	30	14	14	44	44
Female	41	41	15	15	56	56

Table 3: Risk factors associated with hypertension.

Risk factors	Non-hypertensive (n=61)		Hypertensive (n=39)		Total (N=100)	
	No.	%	No.	%	No.	%
Addiction						
Smoking	10	10	07	07	17	17
Tobacco chewing	20	20	12	12	32	32
Snuffing	06	06	07	07	13	13
Non-addicted	31	31	13	13	44	44
Body mass index						
Over-weight	20	20	17	17	37	37
Non-obese	41	41	22	22	63	63
Associated co-morbid condition						
DM	0	0	5	5	5	5
CHD	0	0	8	8	8	8

DISCUSSION

In the present study the overall prevalence of hypertension was found to be 18%. Similar findings have also been reported in other studies. Comparable prevalence (15%) was found in the study conducted at squatter settlement of Karachi (Pakistan). Similar prevalence of hypertension (16.9%) has also been reported in the study conducted among labour population of Gujarat. A higher prevalence (20.6%) was reported in the study conducted among adult population at rural Wardha. Prevalence of 23% was reported by Cielito in rural areas of Philippines. The WHO estimates the prevalence of HTN at 20% among adult populations in several countries. However, a study among tribal "Oraon" population of Orissa revealed lower prevalence of hypertension (4.6/1000 population). Similar finding (prevalence 5.8%) was also noted by Chadha et al among Gujaratis residing in Delhi and prevalence of 7.8% was reported in hospital patients, Mumbai. Differential rates are due to different cut-off points in determining the level of hypertension and also to the differing age groups constituting the study population.⁴⁻⁶

The prevalence of hypertension rises with the advancing age i.e. it was maximum in the age group of 50–60 years, while minimum in the age group of 20–29 years. Strong statistical association was found between the age group and hypertension ($p=0.0001$). Age increase prevalence of hypertension was also reported by Todkar et al. Similar observations were found in other studies. This increase in

age incidence of hypertension can be explained by changes in the lifestyle, migration, stress, atherosclerotic changes in the blood vessels that happen with the age and certain genetic and environmental factors.^{7,8}

Addiction to any form of tobacco was found to be 32% in the study subjects. Prevalence of hypertension was higher among addicted in comparison with non-addicted. This difference is statistically significant. There is a plethora of studies suggesting the tobacco consumption as an important and independent risk factor for hypertension and cardiovascular diseases. A positive association was observed between body mass index and development of hypertension. Persons having BMI more than or equal to 25 reported with higher risk of hypertension. The similar findings were reported by number of epidemiological studies e.g. Todkar et al, Das et al, and Reddy et al. Associated co-morbid conditions such as diabetes and coronary heart disease (CHD) were observed among hypertensives. These findings were supported by Reddy et al. Education, occupation and marital status has not been significantly associated with hypertensives as observed in the current study ($p>0.05$).^{9,10}

Two previous prospective observational studies reported an increased hypertension risk in current smokers but not in former smokers. Another observational study found an increase in blood pressure following smoking cessation, but this association might be driven by residual confounding related to weight gain. In our MR study, we

found an association between smoking initiation (ever smoked regularly) and increased hypertension risk, a finding that is in line with a previous MR study on smoking and arterial hypertension in UK Biobank, but not with another MR study that did not observe an association between 2 smoking-increasing alleles and hypertension. Despite the uncertainty about the evidence for smoking and hypertension, smoking should still be discouraged as the total body of evidence robustly indicates that smoking is a strong risk factor for CVD.¹¹⁻¹³

Limitations

Overall, the results of present study indicate that there is a significant burden of hypertension in the Mandya district. However, the present study does not reflect true prevalence of hypertension in the district, as only patient coming to hospital were analyzed this could be limitation of the study.

CONCLUSION

Cardiovascular risk factors and lifestyle behaviors are amenable to modification and may therefore be relevant targets in the prevention of hypertension. For some modifiable risk factors, it is unclear whether they are causally related to hypertension. This study found that, BMI, alcohol dependence, insomnia, and educational level are causal risk factors of hypertension. This improved understanding of the pathophysiology of hypertension can be used to identify additional targets for the prevention of hypertension and its association diseases.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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