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Prevalence, Risk Factors and Complications in Hypertensive Patients in Warangal Region

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Abstract

Background and purpose: Hypertension is one of the most common worldwide diseases afflicting humans and is a major public health problem. It's an important area of research due to its high prevalence and being major risk factor for cardiovascular diseases and other complications. Due to the associated morbidity and mortality and cost to society, preventing and treating hypertension is an important public health challenge. The objective of the study is to assess the prevalence of hypertension and its associated risk factors and complications.

Materials and methods: A total of 99 patients were enrolled in cross- sectional study for a period of 3 months.

Results: Out of 99 patients, male (57.5 %) were more prone to hypertension than female (42.4 %). Prevalence was high in the older age group i.e., > 60 years (33 %). The mean systolic and diastolic pressure was 124 mmHg and 77 mmHg respectively. Gender (male - 57.5 %), age (> 60 years - 33 %), smoking (20 %), alcohol use (10 %), family history (1 %) and chronic disease conditions (24 %) were significantly associated with hypertension status of the study subjects. Uncontrolled high blood pressure has led to complications which include Dilated Cardio Myopathy (3 %), Coronary Artery Disease (9 %), Ischemic Heart Disease (4 %), heart failure (1 %), aortic aneurysm (1 %), stenosis (1 %), hyperlipidemia (5 %), diabetes mellitus (21 %), acute kidney injury (3 %), chronic kidney disease (22 %) and cerebral stroke (21 %).

Conclusion: Around one-third patients were hypertensive. Awareness should be created to avoid unhealthy lifestyles, investing in workforces to eliminate the modifiable risk factors for non-communicable diseases and promote healthy practices.

Keywords: Hypertension, Risk factors, Prevalence, Complications

Introduction

Hypertension is a global public health challenge due to its high prevalence and the concomitant increase in risk of stroke and cardiovascular diseases (1). Around 7.5 million deaths or 12.8 % of the total of all annual deaths worldwide occur due to high blood pressure. It is predicted to be increased to 1.56 billion adults with hypertension in 2025. Hypertension (HTN) or high blood pressure is defined as abnormally high arterial blood pressure. According to the Joint National Committee 7 (JNC7), normal blood pressure is a systolic BP < 120mmHg and diastolic BP < 80mmHg. Hypertension is defined as systolic BP level of ≥ 140mmHg and/ or diastolic BP level ≥ 90mmHg. The grey area falling between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP is defined as "prehypertension". Although prehypertension is not a medical condition in itself, prehypertensive subjects are at more risk of developing

HTN (2). Hypertension is one of an insidious onset disease that damages the fragile capillary beds in many organs such as kidney or may cause rapid rupture of blood vessels causing haemorrhage in organs such as brain. It is a main risk factor for cardiovascular morbidity and mortality, surpassing obesity, diabetes mellitus and smoking. Hypertension is a major predictor of premature death and cardiovascular disability that poses a huge economic burden to both medical cost and human capital loss (3). The cause of hypertension is often not known. In many cases, it is the result of an underlying condition.Primary hypertension can result from multiple factors, including:

- blood plasma volume
- hormone activity in people who manage blood volume and pressure using medication
- environmental factors, such as stress and lack of exercise

Secondary hypertension has specific causes and is a complication of another health problem.Chronic kidney disease (CKD) is a common cause of high blood pressure, as the kidneys no longer filter out fluid. This excess fluid leads to hypertension.

Conditions that can lead to hypertension include:

- diabetes
- kidney disease
- pheochromocytoma, a rare cancer of an adrenal gland
- Cushing syndrome
- congenital adrenal hyperplasia, a disorder of the cortisol-secreting adrenal glands
- hyperthyroidism
- hyperparathyroidism, which affects calcium and phosphorous levels
- pregnancy
- sleep apnea
- obesity (4)

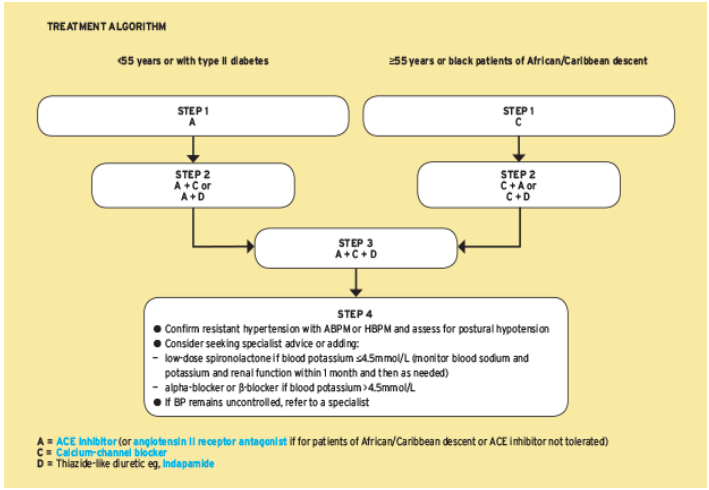
Rapid urbanization, age, mechanization, sedentary life and dietary changes act together as a web of risk factors which entangles people in it and leads to several chronic diseases. In order to take effective prevention measures, identification of the risk factors is an essential prerequisite. This study intends to generate information on prevalence of hypertension and their associated risk factors and complications in Warangal region (2). Table 1 illustrates the comparison of American and European society definitions and management of hypertension. Figure 1 depicts the standard treatment of hypertension.

Table 1: Comparison of American and European society definitions and management of hypertension (5)

CENTRAL ILLUSTRATION: Comparison of American and European Society Definitions and Management of Hypertension

Guideline Differences	American College of Cardiology/American Heart Association (ACC/AHA)		European Society of Cardiology/European Society of Hypertension (ESC/ESH)	
Level of blood pressure (BP) defining hypertension	Systolic (mm Hg) and/or	Diastolic (mm Hg)	Systolic (mm Hg) and/or	Diastolic (mm Hg)
Office/Clinic BP	≥ 130	≥ 80	≥ 140	≥ 90
Daytime mean	≥ 130	≥ 80	≥ 135	≥ 85
Nighttime mean	≥ 110	≥ 65	≥ 120	≥ 70
24-hour mean	≥ 125	≥ 75	≥ 130	≥ 80
Home BP mean	≥ 130	≥ 80	≥ 135	≥ 85
BP targets for treatment	< 130/80 mm Hg		Systolic targets < 140 mm Hg and close to 130 mm Hg	
Initial Combination Therapy	Initial single-pill combination therapy in patients > 20/10 mm Hg above BP goal		Initial single-pill combination therapy in patients ≥ 140/90 mm Hg	
Hypertensive requiring intervention	> 130/80 mm Hg		≥ 140/90 mm Hg	

Guideline Similarities	ACC/AHA	ESC/ESH
Importance of home BP monitoring	• Take BP at home, twice in the morning and twice in the evening, in the week before clinic • Bring the BP machine in annually for validation	
Therapy	• Restrict beta blockers to patients with comorbidities or other indications • Initial single pill combination as initial therapy	
Follow-up	• Detect poor adherence and focus on improvement • BP telemonitoring and digital health solutions recommended	



Materials and methods

A cross-sectional study was carried out at a multispecialty hospital, Warangal for a period of 3 months in the age group of 21 years and above. Individuals who are unable to give response due to serious physical or mental illness were excluded from the study. In all the 99 patients, a structured interview was conducted to obtain data on socio demographic parameters.

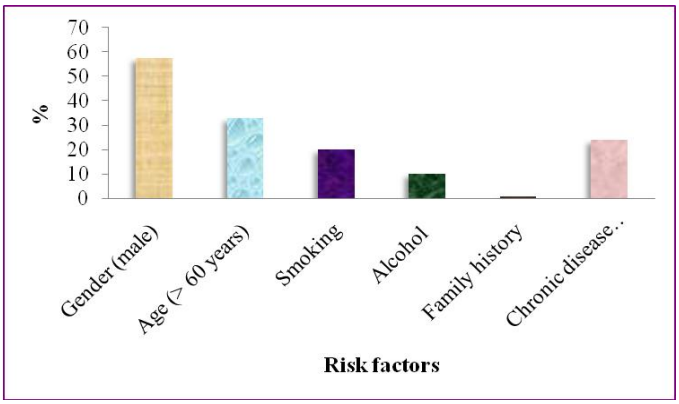
Results

Of 99 patients, 57 (57.5 %) patients were male and 42 (42 %) were female. Prevalence was higher in the eldest age group i.e., > 60 years (33 %) followed by 41 – 50 years (24 %), 51 – 60 years (22 %), 31 – 40 years (13 %) and 21 – 30 years (7 %). It was higher among male (57.5 %)againstfemale(42 %).The age group which was most affected with hypertension among male and female subjects were 41 – 50 years and> 60 years age groups respectively.Table 2 depicts the prevalence of hypertension in different age groups. 57.5 % patients had a history of hypertension. The mean systolic and diastolic BP of all the study subjects was 124 mmHg and 77 mmHg respectively. In men, highest mean systolic BP and mean diastolic BP were among the 31 – 40 age group (150 mmHg and 92 mmHg), while in female ,the highest mean value of systolic and diastolic BP were among the 60 years and above age group (142.7 mmHg and 88.6 mmHg). With regard to systolic BP, there was significant difference among all the age groups with respect to male and female subjects and the same was with diastolic BP as well. Table 2 illustrates systolic and diastolic blood pressure in different age groups gender wise.

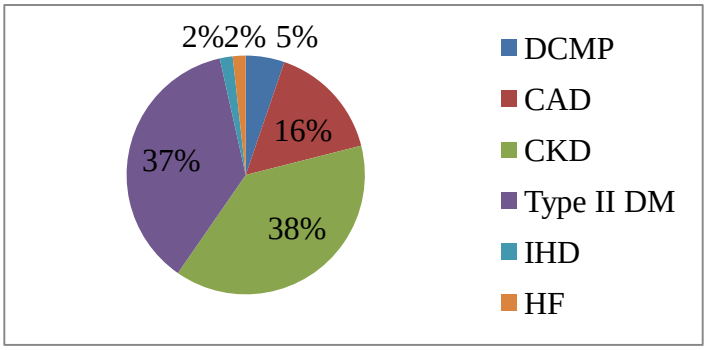
Table 2: Prevalence and mean systolic and diastolic BP of study patients

Age (years)	Prevalence	Mean systolic BP (mmHg)		Mean diastolic BP (mmHg)	
		Male	Female	Male	Female
21 – 30	7	127	-	83	-
31 – 40	13	150	138.5	92	88.5
41 – 50	24	141	123	91	77
51 – 60	22	138	131	83	81
>60	33	146	143	87.5	89

Figure 2 shows the associated risk factors of hypertension. Gender (male - 57.5 %), age (> 60 years - 33 %), smoking (20 %), alcohol use (10 %), family history (1 %) and chronic disease conditions (24 %) weresignificantlyassociatedwiththehypertensionstatusofthes tudy subjects.



Uncontrolled high blood pressure has led to complications which include DCMP (3 %), CAD (9 %), IHD (4 %), HF (1 %), aortic aneurysm (1 %), stenos is (1 %), hyper lipidemia (5 %), DM (21 %), AKI (3 %), CKD (22 %) and cerebral stroke (21 %). Figure 3 outlines the complications of hypertension.



Discussion

High blood pressure is a major concern because of its role in the causation of vascular complications, coronary heart disease and stroke. The overall burden of hypertension–associated diseases is increasing, possibly due to an epidemiological transition, aging population, urbanization and an increase in age-specific rates of many chronic conditions. The present study highlights major risk factors and complications of cardiovascular diseases. The incidence of hypertension in our study (57 % and 42 % in male and female) was higher in comparison with the incidence reported in other studies. According toAlemayehu Bayray *et al.,* 2018 gender specific incidence was 24.2 % and 22.7 % among male and female respectively (7).The major difference in incidence of hypertension between the present study and other studies could be due to social and cultural differences, dietary and lifestyle factors, and also the age span. Men exhibit higher prevalence than female (57.5 % and 42 % respectively). Similarly, various studies came out with the higher percentage of hypertension in men than women. A study conducted by Prasutr Thawornchaisit *et al.,* reported that 5.2 % male were prone to hypertension than female (2.1 %) (1). Reason being biological sex difference and partially due to behavioural risk factors like smoking, alcohol consumption, or physical inactivity. The study population age ranged from 21 to > 60 years. We found that 33 % of the population from > 60 years were more affected with hypertension compared with the other age groups. In contrast, Abdurrahman Aldiab *et al.*,noticed that 30 – 39 years age group were hypertensive (3). As per Maj Rekha Sharma *et al.,* 2019 the mean systolic BP calculated was 130 mmHg whereas diastolic BP was 83 mmHg which was almost similar to our study i.e., 124 mmHg and 77 mmHg. In our study 57.5 % patients were having a history of hypertension which is in contrast with the study conducted by Maj Rekha Sharma *et al.,* 2019 (68.7 %) (8). *Alemayehu Bayray et al.,* 2018 reported that being male (57.2 %), ages groups of 30–49 years, Body Mass Index (BMI); underweight, and obesity were determinants for hypertension. We observed that gender (male - 57.5 %), age (> 60 years - 33 %), smoking (20 %), alcohol use (10 %), family history (1 %) and chronic disease conditions (24 %) were significantly associated with hypertension (7). In our study we noticed that hypertension has led to complications wherein 22 % of the subjects were suffering from chronic kidney disease followed by stroke and diabetes mellitus (21 %). In contrast John N. Booth III *et al.,*2017 reported that thelargestgroups were suffering from coronary artery disease followedby stroke and heart failure (9).

Conclusion

Overall, the results of our study reported hypertension to be prevalent particularly among adult males. We were able to identify that gender, age, chronic disease conditions and smoking were dominant risk factors associated with hypertensive states. Clinical pharmacist can play a major role by promoting hypertension awareness, early detection of hypertension and emphasizing preventive measures in improving health literacy like weight management, increased physical activity, life style changes, dietary modifications and reduction in tobacco and alcohol use.

Abbreviations

ABPM: Ambulatory Blood Pressure Monitoring

ACC: American College of Cardiology

ACEI: Angiotensin Converting Enzyme Inhibitor

AHA: American Heart Association

ARB: Angiotensin Receptor Blockers

BMI: Body Mass Index

BP: Blood Pressure

CAD: Coronary Artery Disease

CCB: Calcium Channel Blocker

CKD: Chronic Kidney Disease

DCMP: Dilated Cardiomyopathy

DM: Diabetes Mellitus

ESC: European Society of Cardiology

ESH: European Society of Hypertension

HBPM: Home Blood Pressure Monitoring

HTN: Hypertension

HF: Heart Failure

IHD: Ischemic Heart Disease

JNC 7: Joint National Committee

NICE: National Institute of Health and Care Excellence

TIA: Transient Ischemic Attack

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