International Journal of Pharmaceutical and Bio-Medical Science

ISSN(print): 2767-827X, ISSN(online): 2767-830X

Volume 02 Issue 11 November 2022

Page No: 518-523

DOI: https://doi.org/10.47191/ijpbms/v2-i11-08, Impact Factor: 5.542

Prevalence and Predictive Risk Factors of Hypertension

Mamdouh Mohammed Zowaid Al-Nefaie[1], Majed Musa Alsuwairi[2], Tahani Ayash Alburih[3], Ashwaq Saad Alshweegi[4], Abdullah Mohammed Alshahrani[4], Abdulrahim Taqi Ali Albukheder[5], Ibrahim Abdullah Muhammad Alhomood[6], Ali Mohammad aish al khalifah[7], Sabah Mohammed Asiri[8]

[1,2,3,4,5,6,7,8]Ministry of Health, Saudi Arabia

ABSTRACT

Worldwide, the prevalence of diseases caused by and related to hypertension is rising. The goal of the current study was to investigate the causes of hypertension in hospital in patients receiving tertiary care.

Patient information was gathered, including demographics, laboratory results, and the final diagnosis. The six-month study, which involved 160 patients overall, was conducted. 20% did not have hypertension, making up the remaining 80%.

Between the hypertensive and non-hypertensive population, risk factors for hypertension such as smoking, alcohol use, demographics, socioeconomic status, diet, family history, family size, education level, salt intake, lifestyle, and basic metabolic index were compared.

In the study population, it was discovered that drinking alcohol, smoking, and eating a varied diet were significant risk factors for hypertension. As a result, these factors can be taken into account when creating effective prevention strategies and management guidelines for hypertension at the study site.

KEYWORDS: Hypertension; Risk factors; Inpatients; Smoking; Alcohol; Diet

ARTICLE DETAILS

Published On:
15 November 2022

Available on:
https://ijpbms.com/

INTRODUCTION

Every year, nearly 18 million people die as a result of cardiovascular disease (CVD). Despite tremendous progress in disease management, CVD accounts for 30% of global deaths. CVD can be caused by a variety of genetic and acquired risk factors. One of the major risk factors is systemic hypertension, which is the leading cause of excessive premature mortality and morbidity due to CVD.

The overall prevalence of hypertension in India was found to be 29.8%. Hypertension affects approximately 33% of urban and 25% of rural Indians. Hypertension affects nearly 60% of people over the age of 70. The prevalence of hypertension-related disease is rising in India. Controlling this syndrome is critical because India is on a path to an unprecedented increase in cardiovascular mortality.[1]

Epidemiology is the study of the distribution of diseases and other health-related conditions in populations, as well as its application to health-problem control. The goal of epidemiology is to understand what risk factors are associated with a specific disease and how disease can be prevented in groups of people. Epidemiologic studies can be used for a variety of purposes, the most common of which is to estimate the frequency of a disease and find associations that suggest potential causes of a disease. To achieve these objectives, disease (incidence) and death (mortality) rates are calculated within population groups. Epidemiology is fundamentally interdisciplinary, employing knowledge from biology, sociology, statistics, and other disciplines.[2]

Many modifiable factors contribute to hypertension's current high prevalence rates. Overweight and obesity, harmful alcohol use, physical inactivity, psychological stress, eating too much salt, inadequate intake of fruits and vegetables, socioeconomic determinants, and so on.[3]

The current study was conducted to determine the prevalence of hypertension and the risk factors that contribute to the development of hypertension in tertiary care hospital inpatients, in order to assist health care professionals and policymakers in developing guidelines and treatment protocols. Despite the fact that many studies

have been conducted on specific populations, there is a scarcity of studies conducted to identify the risk factors of hypertension in urban.

MATERIALS AND METHODS

The research was carried out over a six-month period, from October 2018 to March 2019.

The patients were enrolled in the study based on the study protocol's inclusion and exclusion criteria.

Inclusion and Exclusion criteria: All patients admitted to the study site hospital who were over the age of 18 and willing to participate in the study were included in the study. The study excluded mentally retarded people and critically ill patients.

Source of data: Personal interviews with patients and their representatives were used to collect data in the patient record.

After receiving approval and clearance from the Institutional Ethics Committee, this study was launched. Patients were enrolled in the study after signing an informed consent form and providing consent. After each patient signed an informed consent form, patient details such as demographics, final diagnosis, laboratory tests, and other information were collected from their records and documented in self-designed patient data collection forms.

Definitions for various variables: Hypertensives:

Measurement of blood pressure: Two blood pressure (BP) measurements were taken on each study participant using a mercury column sphygmomanometer, and daily BP measurements were recorded in the patient record.[4] According to the JNC VI guidelines, the patients were classified as normal, prehypertensive, hypertensive stage 1 and hypertensive stage 2.[4]

Table 1. Patient categories based on BP measurements [4]

Category	SBP mmHg	DBP mmHg
Normal	<120	<80
Pre hypertension	120-139	80-89
Hypertension Stage 1	140-159	90-99
Hypertension Stage 2	≥160	≥100

Smoker: A person who has smoked at least 100 cigarettes in his lifetime and has smoked every day or on some days in the last 30 days.[5] **Tobacco consumption:** A person who has consumed smokeless tobacco once a day or nearly every day in any form for the previous 12 months is defined.[5]

Alcohol consumption: A current consumer was defined as someone who had consumed alcohol every day or on some days in the previous 30 days. A past consumer was defined as someone who used to drink but no longer does. 12 months prior.[5]

Salt intake: The estimated salt intake was calculated by dividing the amount of salt used by the family by the number of family members and multiplying by 1000.**Economic background:** Lower Income= 5 Lacks; Middle Income = 5-10 Lacks; and Higher Income = > 10 Lakhs were the study subjects' annual income levels. [6]

Body mass index: The Body Mass Index (BMI) was computed using the formula = Weight (Kg)/(Height (cm)).[2,,] Patients were classified as underweight (BMI 18.5); normal (BMI 18.5 - 25); or overweight (BMI >25) based on their BMI values.[5]

Statistical analysis: Data was entered into Microsoft Excel and GraphPad was used to analyze it. The results were determined using the InStat chi square test of significance. A two-tailed p value of 0.05 was regarded as significant. The Relative Risk (RR) value was also computed.

RESULTS AND DISCUSSION

The goal of this study was to identify hypertension risk factors and the prevalence of hypertension in a population admitted to a tertiary care hospital. The study included a total of 160 subjects and lasted six months, from October 2018 to March 2019. Figure 1 shows that 128 (80%) and 32 (20%) of the 160 study participants were hypertensive and normotensive, respectively.

As shown in Table 2, the majority of subjects (26%) in the study population were in the age range of 60-69 years, followed by people in the age range of 40-49 years, people over 70 years (21%), and people in the age range of 50-59 years (18%). As shown in Table 2, a similar trend was observed in the hypertensive population. As shown in Table 3, the proportion of male and female patients in the study population was nearly equal (51% & 49%, respectively). When the hypertensive population was divided according to the JNC VII guidelines, the majority of the hypertensive were in Stage 1 (35%) i.e. Systolic 140-149mmHg Diastolic 90-99mmHg), followed by patients in pre hypertension (30%) and patients in Stage 2 (15%), as shown in Figure 2.

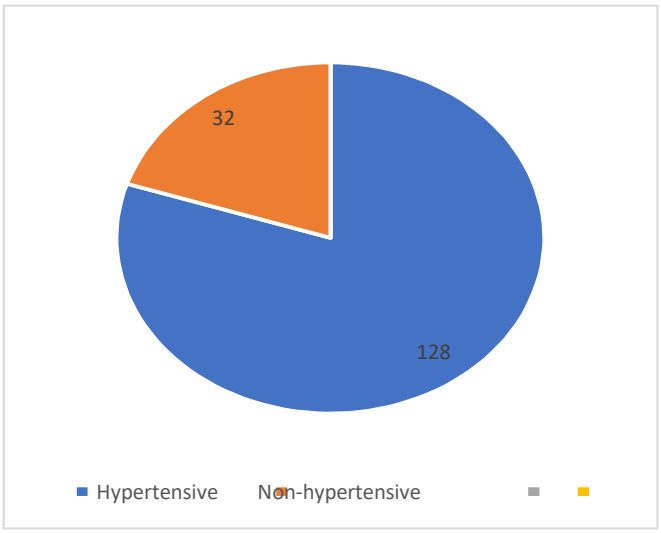

Fig 1. Prevalence of Hypertension in the Study Population

Table 2: Age wise Distribution of Study Population

	Total (%)	Hypertensive (%)	Normal(%)
Male	83 (51)	63 (76)	20 (24)
Female	77 (49)	65 (84)	12 (16)

Table 3: Gender wise Distribution of Study Population

Age inYears	Total Surveyed(%)	Hypertensives	Non- Hypertensive
18 – 29	7 (4)	5	2
30 – 39	15 (9)	12	3
40 – 49	34 (21)	28	6
50 – 59	29 (18)	22	7
60 – 69	41(26)	32	9
ABOVE 70	34 (21)	29	5

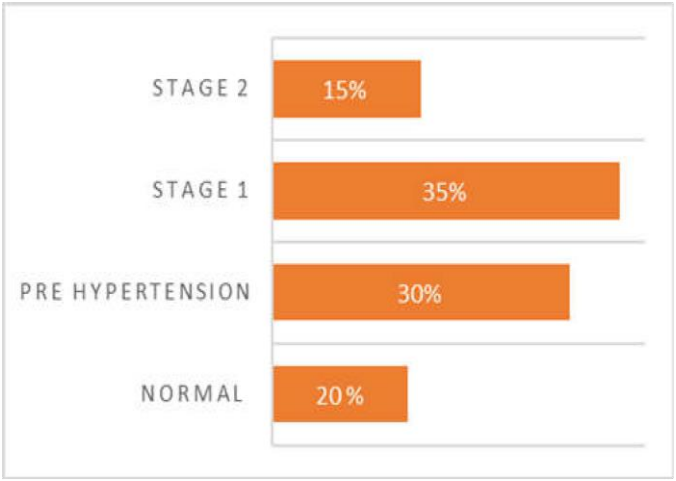

Fig 2. Distribution of Study Subjects as per Stages of Hypertension based on JNC VII guidelines

Socio-Demographic Variables and Prevalence of Hypertension

The sociodemographic characteristics of the hypertensive and non-hypertensive populations were compared in this study. Statistics were used to determine the significance. 55% of hypertensive people smoked, whereas only 25% of non-hypertensive people smoked. Table 4 shows that there was a statistically significant link between smoking and hypertension (p = 0.001; RR = 1.134). As shown in Table 4, there was a statistically significant association (p=0.0025; RR=1.22) between high alcohol consumption and hypertension in our study, with 57% of the hypertensive population being alcoholic and only 28% of non-hypertensives being alcoholics. As shown in Table 4,

23% of our hypertensive patients were diabetic, 58% of non-hypertensives were diabetic, and 72% of hypertensives were not diabetic. As shown in Table 4, the socioeconomic status of hypertensives and non-hypertensives is distributed similarly across low, middle, and high income groups (low 31% in both groups; middle 46% & 44% in hypertensive and non-hypertensives respectively; and high 23% & 25% in hypertensive and non-hypertensives respectively). Income group and hypertension had no statistically significant relationship (p=0.99). As shown in Table 3, the majority of patients in both populations belonged to the middle-income group. In this study, a higher percentage of hypertensive and non-hypertensive patients consumed a mixed diet (85% and 66% in the hypertensive and non-hypertensive populations, respectively), but a higher percentage of non-hypertensive patients (34%), as shown in Table 4. Diet and hypertension had a statistically significant relationship (p=0.0028; RR=2.9). Table 4 shows that more people in the hypertensive group (59%) had a family size of more than 5, compared to the smaller family size (41%) in the control group. The relationship between family size and hypertension was not statistically significant (p=0.81; RR=0.97). As shown in Table 4, the majority of hypertensive patients in our study (62%) did not have a family history of hypertension. A hypertensive family history was found in 38% of hypertensive people and 25% of non-hypertensive people. The link between family history of hypertension and hypertension was statistically significant (p=0.036; RR=1.38). Table 4 also shows that subjects who completed their basic education (literates) (55%) had a higher incidence of hypertension, whereas illiterates (35%) and graduates (10%) had a lower incidence of hypertension. Though there were more hypertensive patients in our study who consumed more than 10g of salt (76%) than those who consumed less than 10g (24%), the association between salt intake in the study population and the incidence of hypertension was not significant (p=1;RR=1), as shown in Table 4. According to the study, 66% of hypertensive people were sedentary, 5% walked infrequently, and 28% walked on a regular basis. The findings were similar in the non-hypertensive population, where 53% were sedentary, 19% were rare walkers, and 28% were regular walkers, as shown in Table 4. The link between physical activity and hypertension was not statistically significant (p=0.36).

According to Table 4, the majority of the hypertensive subjects in the current study had normal BMI. Hypertensives had a BMI of 77% normal and 16% overweight, whereas non-hypertensives had a BMI of 53% normal and 18% overweight. In our study, there was no statistically significant relationship between BMI and hypertension (p=0.4).

In the study, 128 people (80%) had hypertension. We can expect this pattern because the study population included inpatients admitted to a hospital. In the most recent JNC VIII guidelines, higher blood pressure goals (150/90 mmHg) are recommended for people over the age of 60. As a result, we can conclude that only a small number of patients required aggressive treatment to reduce their hypertension (National Institute of Health). This observation, however, cannot be linked to the general population of the study site.

Hypertension was most common in people aged 60 to 69. Many surveys and cross-sectional studies have shown a positive relationship between age and blood pressure, with the age group 60-69 years having the highest incidence[7,8]. Our study's findings are consistent with the observation made above.

In the study population, the proportion of male and female patients was nearly equal. Furthermore, this was observed in the hypertension group. This is an unusual finding, as male patients predominate in some studies9. and in other studies, female patients were more likely to number.[10,7]

Variables		*Hypertensive (%)*	*Non-hypertensive(%)*	*P value*	*RelativeRisk*
Smoking	Smoker	71 (55)	8 (25)	0.001	1.134
	NonSmoker	57 (45)	24 (75)		
Alcohol	Alcoholic	68 (57)	9 (28)	0.0025	1.22
	NonAlcoholic	60 (43)	23 (72)		
Diabetes	Diabetic	36 (28)	17 (53)		0.2
	NonDiabetic	92 (72)	15 (47)		
Socio EconomicStatus	Low(<5Lpa)	40 (31)	10 (31)	0.99	
	Medium (610Lpa)	59 (46)	14 (44)		
	High(>10Lpa)	29 (23)	8 (25)		
Dietary Habit	Mixed	109 (85)	21 (66)	0.0028	2.91
	Veg	19 (15)	11 (34)		
Family size	Less than 5	53 (41)	15 (47)	0.81	0.97
	Greater than 5	75 (59)	17 (53)		
Family History	Yes	48 (38)	8 (25)	0.036	1.38
	No	80 (62)	24 (75)		

Education	Illiteracy	70 (55)	4 (13)		
	Schooling	45 (35)	13 (41)		
	Graduate	13 (10)	15 (47)		
Salt Intake	Less than 10 g	31 (24)	10 (31)	1.00	1.01
	More than 10 g	97 (76)	22 (69)		
Physical Activity	Sedentary	85 (66)	17 (53)	0.36	
	Rare Walking	7 (5)	6 (19)		
	RegularWalking	36 (28)	9 (28)		
BMI	Malnourished	8 (6)	5 (16)	0.40	
	Normal	99 (77)	17 (53)		
	Overweight	21 (16)	5 (18)		
	Obese	0	5 (18)		

Table 4. Socio demographic variables and prevalence of hypertension

Higher exposure to risk factors such as alcohol, smoking, and lack of physical activity in male patients may explain the slightly higher prevalence. In a few studies, lower incidence of hypertension in women was attributed to greater health consciousness in women and a reluctance to report poor health[9,10]

It has been proposed that smoking raises blood pressure by increasing sympathetic activity. 8 It was discovered that there is a statistically significant association between smoking and hypertension (p= RR=1.134), which is consistent with the findings of one study,[8] However, in contrast to the other two studies, there was no significant association between smoking and the incidence of hypertension.[3,11]

Hypertension and alcohol consumption were also found to have a statistically significant relationship. By interacting with receptors in brain stem cells, alcohol reduces the baro reflex. Two studies found a link between alcohol consumption and hypertension4,8, and another found a link between alcohol consumption and hypertension6. However, another study found no significant link between smoking and the occurrence of hypertension.[3]

In our study, the majority of patients did not have diabetes in addition to hypertension. This is a very unusual finding in this study. This observation could be due to a small sample size or a population characteristic. However, a significant relationship between diabetes and hypertension was discovered in two other studies.[7,10]10 Sympathetic nervous system, renin-angiotensin-aldosterone system, oxidative stress, adipokines, insulin resistance, and Peroxisome proliferator-activated receptor are all shared pathways in diabetes and hypertension. These pathways interact and influence one another, potentially resulting in a vicious cycle. The metabolic syndrome results in both hypertension and diabetes. As a result, they may appear one after the other in the same person.[13]

The majority of study participants came from the middle-income bracket. Socioeconomic status had no relationship with hypertension. This observation reflects the average socioeconomic status of those who visit this hospital. In one study, low socioeconomic status was linked to an increased risk of hypertension. 7 In another study, people with higher socioeconomic status had a lower incidence of hypertension.[3] In our study population, a vegetarian diet was linked to a lower incidence of hypertension. Animal fat (mostly saturated) raises LDL cholesterol and increases the risk of heart disease. A vegetarian diet, on the other hand, typically has low cholesterol and thus a lower incidence of hypertension. [13]13A similar finding was made in a study conducted in Nellore, Andhra Pradesh, India.[7]

Although subjects with more than five family members had a higher incidence of hypertension, this link was not statistically significant. This finding is similar to one from another study in which increased family size was found to be significantly associated with hypertension. Increased responsibility and lower self-care in large families could explain the higher incidence of hypertension in our study.[10]

The majority of the hypertensive subjects in our study had no family history of hypertension. However, when compared to non-hypertensive patients, a greater number of patients in the hypertensive group had a family history of hypertension, and the relationship between hypertensive and non-hypertensive patients' family history was statistically significant. According to a WHO expert group report, a family history of high blood pressure is one of the most significant risk factors for the development of hypertension in individuals. 3 A statistically significant association was found between family history of hypertension and hypertension in individuals in a study conducted among bank employees and another study.[3,8] The current study's findings may be interpreted as subjective. This erroneous outcome can be attributed to a lack of communication and awareness, as well as underdiagnosis among family members.

Although there was a link between salt intake and hypertension, it was not statistically significant. This link was found to be significant in one study.[7] The association was not significant in study by Brahmankar *et al.* [3] We can

attribute this observation to lower number of sample size of our study.

Sedentary lifestyle was found in the study population, but more subjects in the non-hypertensive group exercised on a regular basis. Hypertension is linked to sedentary lifestyle, advanced age, and obesity. Participants with sedentary work styles are more likely to have hypertension than those with active work styles. A similar finding was made in two additional studies where the association was significant.[3,8]

This finding could be attributed to the study population's increased awareness of the effect of body weight on hypertension. As a result, there was no significant relationship between BMI and hypertension (p=0.40). This finding contrasts with other studies that found hypertension to be significantly related to BMI.[3,8,10]

CONCLUSION

The purpose of this study was to identify risk factors for hypertension in tertiary care hospital inpatients. In this study population, the most important lifestyle risk factors for hypertension were smoking, alcohol consumption, and diet. As a result, these factors should be considered by the physician when managing hypertension with appropriate community-based screening and treatment strategies. This study has provided useful data for hospital planning and implementation of hypertension prevention programs.

In the future, the study's sample size can be increased to produce more representative data. A similar study could be carried out in a community setting to determine the prevalence and risk factors for hypertension.

REFERENCES

I. Mangal A, Kumar V, Panesar S, Talwar R, Raut D, Singh S. Updated BG Prasad socioeconomic classification, 2014: A commentary.Indian J Public Health. 2015;59(1):42-4.

II. Ahmed A, Rahman M, Hasan R, Shima S A,

III. M. H. Faruquee, Islam T, Haque S E. Hypertension and associated risk factors in some selected rural areas of Bangladesh.International Journal of Research in Medical Sciences.2014;2(3):925-931.

IV. Cheung M. Y. B and Li C.Diabetes and Hypertension: Is There a Common Metabolic Pathway? Curr Atheroscler Rep. 2012;14(2):160–166.

V. Everetti B and Zajacova A. Gender Differences in Hypertension and Hypertension Awareness Among Young Adults. Biodemography Soc Biol. 2015;61(1):1–17.

VI. Erem C, Hacihasanoglu, Kocak M, Deger O, Topbas M. Prevalence of prehypertension and hypertension and associated risk factors among Turkishadults: Trabzon Hypertension Study. J Public Health 2008;31(1):47–58.

VII. Fraser GE. Vegetarian diets: what do we knowof their effects on common chronic diseases? Am J Clin Nutr.2009;89(5):1607S–1612S.

VIII. Chopra HK, Ram VS. Recent Guidelines for Hypertension. A Clarion Call for Blood Pressure Control in India. Circ Res. 2019; 124:984-986.

IX. Kannan L, Satyamoorthy TS. An epidemiological study of hypertension in a rural household community Sri Ramachandra Journal of Medicine 2009;II(2):9-13.

X. Singh M K, Singamsetty B, Kandati J. An epidemiological study of prevalence of hypertension and its risk factors in a rural community of Nellore, Andhra Pradesh, India.Int JCommunity MedPublic Health2016;3(12):3408-3414.

XI. National Research Council. 2012. Analysis of Cancer Risks in Populations Near Nuclear Facilities: Phase 1. Washington, DC: The National Academies Press. [Online] Available:https://www.nap.edu/catalog/13388/analysis-of-cancer-risks-in-populations-near-nuclear-facilities-phase. [Accessed:20 August 2020]

XII. National Institute of Health. Reference Card for the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) [Online] Available; https://www.nhlbi.nih.gov/files/docs/guidelines/phycard.pdf [Accessed 16 August 2020]

XIII. Singh S, Shankar R, and Singh G P. Prevalence and Associated Risk Factors of Hypertension: A Cross-Sectional Study in Urban Varanasi. Int J Hypertens.2017;1-10.

XIV. Brahmankar T R, Prabhu P M. Prevalence andrisk factors of hypertension among the bank employees of Western Maharashtra – a cross sectional study. Int J Community Med Public Health 2017;4(4):1267-1277.