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Original Research Article

Assessment of prevalence of hypertension in an urban population: a cross sectional study in Indore city

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ABSTRACT

Background: Hypertension is growing rapidly to epidemic levels in the developing countries, that's why described by some clinicians as a 'silent killer'. The objective of the study was to study the prevalence of hypertension among adults in urban area of Indore city.
Methods: A community based survey was conducted among the 375 residents of urban population of Indore.
Results: In our study 157 subjects were found to be hypertensive with the prevalence of 41.9%. Where; new cases of hypertension were found to be with prevalence of 15.7%. Out of which males were 44 (20.3%). Whereas, previously diagnosed 98 (62.4%) subjects were on anti-hypertensive medication and 59 (37.6%) newly diagnosed subjects who did not know they were having hypertension.
Conclusions: The prevalence of hypertension in study subjects was 41.9%. 15.7% subjects didn't know that they were having hypertension. 31.6% of hypertensive subjects were on irregular medication. It was found that lack of awareness, negative attitude of people for practicing modifiable risk factors associated with hypertension.

Keywords: Prevalence, Hypertension, Urban population

INTRODUCTION

Major health transitions in the world were witnessed in second half of the 20th century which was propelled by technological changes and socio-economic changes which profoundly altered ways of living and life expectancy while creating an unprecedented human capacity to use science to enhance and prolongation of life.[1]

According to the World Health Organization, non-communicable diseases constituted by cardiovascular diseases (including hypertension), diabetes, cancers and chronic respiratory diseases are increasing to epidemic levels but are not noticed or little attention is paid to them especially in the developing and underdeveloped countries.[2]

In spite of an non-communicable disease; hypertension is emerging rapidly to an epidemic level in developing countries in which urbanization plays an important role. This invisible epidemic is an unexpected and underappreciated cause of poverty and hinders to the economy of many countries.[2]

Most of the time hypertensive people show no symptoms in the early stages, symptoms only manifest after end-organ damage. That is why hypertension is described by some clinicians as a 'silent killer'.[3,4]

In Joint National Committee of hypertension (JNC-8) guidelines; antihypertensive medications to be initiated in patients less than 60 years old, if systolic blood pressure is ≥140 mm Hg and the diastolic blood pressure is ≥90 mm Hg despite non pharmacologic therapy and if a patient is 60 years old and older, antihypertensive therapy to be initiated if the systolic blood pressure is ≥150 mm Hg and the diastolic blood pressure is ≥90 mm Hg.[5]

Due to increasing trend of hypertension in community an attempt was made to study the prevalence of hypertension among adults in urban area of Indore city.

METHODS

Research design and location

The present study was conducted at Sri Aurobindo Medical College and PG Institute in Department of Community Medicine. A community based cross sectional study was conducted through clinical examination among the residents of the Khatiwala tank, Indore.

The study area, Khatiwala tank, Indore, was selected from the list of areas of Nagar Nigam, Indore, by Lottery method. The list of voters was taken from the Chief Electoral Office, Madhya Pradesh and refined.[6]

Inclusion criteria

All individuals of 20 years and above whose names were included in voter list of 2016.

Exclusion criteria

All individuals below 20 years whose names were included in voter list of 2016. Whereas, individuals of other area, such as relatives, friends, students from the sample. And even those individuals who were not interested and not given consent.

Study period

The study was carried out from 1st of August 2016 to 31st August 2017.

Ethical consideration

Study received permission of the Institutional Ethical and Research committee of Sri Aurobindo Medical College and Post Graduate Institute, Indore. The investigator applied ethical principles that protected the participants from any harm or risk during research. Anonymity and confidentiality of study subjects were ensured throughout the study.

The investigator ensured anonymity by using numbers or codes and reported data for the entire group.

Targeted population, settings and instruments for getting the information

In the study; investigator approached society's social workers, leaders, friends and relatives who informed and motivated the families to participate in the study. All the participants were explained about the purpose of the study and were ensured strict confidentiality, and then informed verbal consent was taken from each participant before the interview and examination.

The data collection tool used for the study was a predesigned and pretested pro-forma containing questions related to the information on socio demographic status such as age, sex, history of hypertension, duration of illness and pattern of medication was interviewed along with their blood pressure readings.

Sample size estimation was based on the relevant study on increasing trend of hypertension in community with prevalence of 42.0%. Anchala et al was derived for estimating the sample size.[7]

Assuming for present study the prevalence rate of 42% at 95% confidence level and 5% of allowable error, the sample size required was calculated as 375.

Study sample was selected by systematic random sampling; this sampling was based on sampling fraction: Every K^{th} unit was chosen in the population list, where K was chosen by sampling interval.

Sampling interval (K) = Total no. of units in population/ Total no. of units in sample.

In this study the population of Khatiwala tank was 9464 from which sample size of 375 was chosen, the formula applied was;

K= 9464/375= 25.23.

Thus, every 25^{th} unit was included from the sample of 375; i.e. 25^{th}, 50^{th}, 75^{th}, 100^{th} and so on. The first unit among the first 25^{th} was chosen by simple random sampling i.e. 9, and then next 25^{th} was 34^{th} individual of the voter list of Khatiwala tank then 59^{th} individual and so on. If a selected participant was not available on the time of survey or if not interested then the upcoming participant was approached according to sampling interval for the rest of the data collection.

A structured pro-forma was used as a measuring tool for collection of data. In the study mainly close-ended multiple choice questions with few open ended questions were included.

Data analysis

A variable file was created on MS Office Excel 2010. Descriptive statistics were performed for each question.

The responses were classified into two categorical responses yes and no. The rate of correct responses for each question was then described.

RESULTS

Table 1 shows that the present study was conducted on 375 study subjects of urban area of Indore city, where 157 study subjects were found to be hypertensive with the prevalence of 41.9%.

Table 1: Characteristic of study population.

Variables	Male (n) (%)	Female (n) (%)	Total population (n) (%)
Normotensive subjects	119 (54.6)	99 (45.4)	218 (58.1)
Hypertensive subjects	98 (62.4)	59 (37.6)	157 (41.9)
Study population	217 (57.9)	158 (42.1)	375 (100.0)

Table 2: Distribution of study subjects by blood pressure according to JNC classifications.

	Male (n) (%)	Female (n) (%)	Total population (n) (%)
Spectrum			
Normal	119 (54.6)	99 (45.4)	218 (58.1)
Newly diagnosed HTN	44 (74.6)	15 (25.4)	59 (15.7)
On medication			
Normotensive	18 (39.1)	28 (60.9)	46 (12.3)
Hypertensive	36 (69.2)	16 (30.8)	52 (13.9)
Total	217 (57.9)	158 (42.1)	375 (100)

Table 2 represents the present study according to both JNC (7^{th} and 8^{th}) classifications i.e. according to JNC 8^{th} classification; newly diagnosed of hypertension were found to be 59 (15.7%). Out of which male subjects found to be 44 (74.6%). Simultaneously according 7^{th} JNC classification among previously diagnosed hypertensive subject on medication; 46 (12.3%) subjects were diagnosed as normotensive, where 28 (60.9%) female were on higher side. Whereas, 52 (13.8%) subjects were found to be hypertensive even on anti-hypertensive medication out of which 36 (69.2%) were male subjects, found to be on higher side in the study.

Table 3 represents the data according to history of hypertension among 157 hypertensive subjects; where, 98 (62.4%) subjects were previously diagnosed hypertensive and all were on anti-hypertensive medication. There were additional 59 (37.6%) newly diagnosed subjects who did not know they have hypertension. According to sex; 98 (62.4%) males were found to be hypertensive and out of which previously diagnosed were 54 (55.1%) and newly diagnosed were 44 (44.9%). While, according to duration of illness; 38 (38.8%) subjects were suffering for ≥10 years. Whereas according to pattern of anti-hypertensive medication; 67 (68.4%) hypertensive subjects were on regular pattern while 31 (31.6%) subjects were on irregular pattern in the study.

Table 3: Distribution of hypertensive subjects according to history of hypertension, duration of illness and pattern of medication.

Variables	Male (n) (%)	Female (n) (%)	Total (n) (%)
H/o hypertension			
Yes	54 (55.1)	44 (74.6)	98 (62.4)
No	44 (74.6)	15 (25.4)	59 (37.6)
Total	98 (64.4)	59 (37.6)	157 (100)
Duration of illness			
<5 years	20 (64.5)	11 (35.5)	31 (31.6)
≥5 - 9 years	13 (44.8)	16 (55.2)	29 (29.6)
≥10 years	21 (55.3)	17 (44.7)	38 (38.8)
Total	54 (55.1)	44 (44.9)	98 (100)
Pattern of medication			
Regular	35 (52.2)	32 (47.8)	67 (68.4)
Irregular	19 (61.3)	12 (38.7)	31 (31.6)
Total	54 (55.1)	44 (44.9)	98 (100)

DISCUSSION

Similar to our study some studies conducted in Kerala by Lakshman et al. Among 179 male bus drivers, aged 21–60 years and observed 41.3% prevalence of hypertension in the study.[8] In 2014, another similar cross sectional descriptive study conducted at Sokoto, Nigeria by Awosan et al, among 390 traders, found (29.1%) prevalence of hypertension.[9] Similarly in population based cross sectional study conducted in Kang, Botswana by Tshltenge et al, among 161 adult resident aged ≥20 years, found the prevalence of hypertension to be 32%.[10] In 2015, same year another study conducted in rural area of Jharkhand by Kashyap et al, among 500 study subjects with age groups ≥20 years, found the prevalence of hypertension to be 19.8%.[11] Recently, in (2016) a community based cross sectional study conducted in rural area of Kurnool by Sreedevi et al, among 233 individuals with aged ≥35 years, observed 42.42% prevalence of hypertension.[12]

In our study; according to both JNC (7^{th} and 8^{th}) classifications i.e. according to JNC 8^{th} classification; new cases of hypertension were found to be 15.7%. Simultaneously according 7^{th} JNC classification among previously diagnosed hypertensive subject; 52 (13.8%) subjects were found to be hypertensive even on anti-hypertensive medication out of which 36 (16.6%) were male subjects, found to be on higher side in the study. Similar study was conducted in 2010 by Divan et al, among 104 employees of a fertilizer company in Surat district found that overall prevalence of hypertension was

32.7% according to (JNC 6th criteria). Where, 71% employees knew about having hypertension, and the remaining 29% employees were diagnosed as hypertensive during the study who didn't know that they have hypertension.[13]

Another similar study conducted in Dharwad, India by Guddad et al found that while assessing hypertensive subjects majority (61.0%) belonged to mild hypertension category followed by (12.0%) pre-hypertensive category because they were on regular use of antihypertensive medicines. Remaining (22.0%) had moderate and (5.0%) had severe category of hypertension due to irregular pattern of drugs and other factors.[14]

Similar study conducted by Hameed et al, in rural community of Karnataka among 330 elderly aged ≥60 years, found the prevalence of hypertension to be 58.5% according to (JNC 7th criteria). Whereas, among non hypertensive participants 25.5% subjects were newly diagnosed as hypertensive in the study respectively.[15]

Similar study conducted in Jeddah by Ibrahim et al (2008); among 1476 school teachers; found that less than one third (31.8%) of teachers were normotensive, whereas the overall prevalence of HTN was 25.2%. Among all diagnosed hypertensive cases only less than of third (30.4%) were aware of being hypertensive. Among those aware of the problem, 69 cases had controlled HTN (normotensive) in the study.[16]

Our study found that among 157 hypertensive subjects; 98 (62.4%) subjects were previously diagnosed hypertensive and all were on anti-hypertensive medication. Similar study conducted in Dharwad, India by Guddad et al, found that majority of subjects (34.0%) were suffering from hypertension since 1-5 years followed by less than a year (32.0%), 6-10 years (15.0%), more than 10 years (10.0%) and nine per cent of them were newly diagnosed for the disorder in the study.[14]

In 2012, another similar type of study conducted in Bangalore by Madhukumar et al, among 1501 subjects aged ≥15 years, found that the prevalence of hypertension was (8.06%), out of which (86.0%) were aware of their disease. Only (65.4%) were taking regular treatment and (72.0%) had their BP under control. Whereas, (14.0%) were new cases detected as hypertensive during the study.[17]

Similarly, another cross sectional study conducted in Kathmandu, Nepal by Chataut et al found overall prevalence of hypertension was 22.4% (males: 32.7% and female: 15.3%) where almost 40% of hypertensive did not know about their status.[18]

Another study conducted by Hameed et al, in rural community of Karnataka among 330 elderly aged ≥ 60 years, they found self reported hypertensive were 44.2% of which 91.7% were on regular medication in the study.[15]

CONCLUSION

The prevalence of hypertension in study subjects was 41.9%. We found that 15.7% subjects didn't know that they were having hypertension. Whereas, among previously diagnosed; 31.6% of hypertensive subjects were on irregular medication. It is necessary to create awareness, change attitude of people so that they quit and avoid modifiable risk factors associated with hypertension.

Limitation

A cross sectional design was used to conduct this study. This was the most feasible method to determine the availability of study subjects in time bound community based studies. Case control or prospective cohort studies are better for measurements and to identify relationship between hypertension and its associated risk factors.

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