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Opportunistic Screening for Hypertension and Obesity among Patients Attending a Tertiary Care Hospital in Bangalore, India

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Abstract

Background: An estimated 1.28 billion adults in the age group of 30–79 years globally have hypertension. Opportunistic screening would be one method to screen all patients attending health care facility for hypertension and Cardiovascular risk factors. Objectives of this study was to assess the magnitude of the undiagnosed hypertension and obesity by opportunistic screening among the study participants and also to study the factors associated. **Methods and Material:** A cross-sectional study design was carried out in the outpatient department of General Medicine, in a teaching hospital, India. Blood pressure, BMI, waist circumference was measured among patients aged 30 and above. **Results:** Almost one third of the study participants were screened to be having Hypertension (27.6%). More than half of the study participants belonged to the category of overweight according to BMI (64.4%) and majority of them were obese according to waist circumference (Male-81.3%, Female-74.2%)**. Conclusions:** Opportunistic screening is a simple and yet efficient method for screening patients for Hypertension and Obesity. Management of these two important risk factors at early stage will help in preventing cardiovascular events among the patients in the future

Keywords: Opportunistic screening; Non communicable disease; Hypertension; Obesity

Introduction

Non-communicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioural factors. NCD are categorized as follows: cardio-vascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes. Annually 41 million deaths are attributed to non-communicable diseases, corresponding to 74% of total global deaths.

[1] An estimated 1.28 billion adults in the age bracket of 30–79 years globally have hypertension, out of which 2/3rds living in middle and lower income countries. On an estimate, 1/5th of the adult population with hypertension (21%) have it under control through medical intervention and or lifestyle changes like regular exercise and diet. Hypertension is a prime cause of premature deaths globally. One of the global objectives for non-communicable diseases is to cut down the prevalence of hypertension between 2010 and 2030 by 33%.[2] As per latest statistical data, a close estimate of 63% of total mortality in India is due to non-communicable diseases, out of which 27% are caused due to cardiovascular disease which affects nearly half of the population (45%), in the age bracket of 40-69 years. One of the most crucial risk factors involved in the etio-pathogenesis of cardiovascular diseases is increased blood pressure. However, it is poorly controlled due to a combination of factors like reduced awareness regarding hypertension, lack of appropriate intervention through primary care and poor follow up.[3]

Opportunistic screening is one of the objectives of National Programme for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) (currently called as National Programme for Prevention & Control of Non-Communicable Diseases [NP-NCD]).[4]

An estimated 46% of adults with hypertension are unaware that they have the condition. Less than half of adults (42%) with hypertension are diagnosed and treated.[2] Opportunistic screening would be one method to screen all patients attending health care facility for hypertension and cardiovascular risk factors. Additionally it would be an opportunity to raise awareness about Hypertension and Non-Communicable disease to the patients.

Objectives of this study were to assess the magnitude of the undiagnosed hypertension, to measure the prevalence of obesity by opportunistic screening among the study participants and also to assess the factors associated with the undiagnosed hypertension and obesity.

Methods and Material

A cross-sectional study design was carried out in the outpatient Department of General Medicine, Vydehi Institute of Medical Science and Research Centre, Bangalore city in India. The study was conducted for a period of 2 months from November 2023 to December 2023. All Patients aged 30 years and above, who attended the Outpatient department of General Medicine were enrolled in the study

- **Sample size**: In a previous study, 17% of the people were diagnosed to be hypertensive on screening.[5] With 5% absolute precision and 95% confidence, design effect of 1; sample size was calculated to be 217. Sample size was calculated using Open Epi. The sample size was further inflated by 10% to take care of non-response, incomplete

responses and refusals. This gave a sample size of 239

- **Inclusion criteria:** All Patients 30 years and above who attended the Outpatient department of General Medicine and those who gave consent for the study.
- **Exclusion criteria:** Known case of hypertension, pregnant mothers, inability to give consent or inability to comprehend the questions of the study.
- **Sampling method**: Complete enumeration was done in order to reach the sample size. Thus patients fulfilling the eligibility criteria was recruited.
- **Method of data collection:** After obtaining clearance from the Institutional Ethics Committee, a hospital-based cross-sectional study was conducted. The interview schedule included information pertaining to the socio-demographic profile, clinical examination which includes BP measurements and anthropometry (Height, Weight, BMI, Waist circumference); and the factors associated.

Blood pressure was measured in sitting position, 2 readings were taken 5 min apart. Average of 2 readings was considered. BP was measured using Dial BP apparatus. Height was measured by Stadiometer, maintaining the Frankfort plane. Height was measured in centimeter. Weight was measured using weighing machine, patient was asked to stand still, face forward, place arms on the side and weight was recorded in kilograms. BMI was calculated by formula: weight (kg)/height (m^2). Waist circumference was measured by non-stretchable fibre measuring tape. With the arms relaxed at the sides, under the midline of the participant's armpit, at the midpoint between the lower part of the last rib and the top of the hip.[6] Health awareness regarding hypertension and obesity was delivered to the patients. Patients who were detected with high blood pressure, were given appropriate referral. Classification of hypertension was based on Joint National Committee 8 (JNC 8) classification.[7] Obesity was classified based on WHO Asia-Pacific classification for obesity.[8]

Data collection tool

Part 1: Socio-demographic profile and different factors associated with hypertension and obesity were included in the questionnaire, based on literature review.[5,9]

Part 2: Measurement of BP, Height, Weight, BMI, Waist circumference.

Statistical analysis

Data was entered in Microsoft excel and analyzed using SPSS Version 23. Descriptive statistics was reported as mean (SD) or median and inter quartile range (IQR) for continuous variables and frequency (proportions) for categorical variables. Proportions and percentages was used to express categorical variables. Multinomial Logistic Regression was applied to find the association between obesity, hypertension and different

factors.

Ethical issues

Approval from the Institutional Ethics Committee was obtained before conducting the study. Detailed information pertaining to the nature, objectives of the study and test procedures was provided to the study participants and written informed consent was obtained. Anonymity of the study participants was ensured. Strict confidentiality of the information collected was maintained.

Results

Total of 239 study participants were enrolled in the study. Median age of the study participant was 42 years(52, 36). Majority of study participants belonged to the age category of 30-39 years and 40-49 years age group. Females (55.2%) were slightly more than males. Majority of them were sedentary workers (78.7%). Socioeconomic status was classified according to the modified B.G Prasad classification (2023) (Table 1).

Table 1. Socio-demographic characteristics of study participants (N=239)

Variable	Number (%)
Age (in years)	
30-39	91(38.07)
40-49	74(30.96)
50-59	40(16.73)
≥60	34(14.2)
Gender	
Male	107(44.8)
Female	132(55.2)
Residence	
Rural	123(51.5)
Urban	116(48.5)
Education	
Above High school	84(35.1)
High school	70(29.3)
Primary school	26(10.9)
Illiterate	59(24.7)
Type of work	
Sedentary	17(7.1)
Moderate	188(78.7)
Heavy	34(14.2)
Socio-Economic Status	
Class I	67(28)
Class II	62(25.9)
Class III	51(21.3)
Class IV	45(18.8)
Class V	14(5.9)

Majority of the participants were non-smokers (80.3%), followed by current smokers (at least since a month) (13%) and smoked in the past (6.7%). Majority of the study participants did not consume alcohol (89.5%). Majority of the study participants did not have family history of Hypertension (74.5%), Diabetes (77%) and Coronary artery disease (90.4%).

Average blood pressure of the study participants was following, systolic BP was124.8 (±19.98) and diastolic BP was 77(±11.53). Almost one third of the study participants were screened to be having hypertension (27.6%). More than half of the study participants belonged to the category of overweight according to BMI (64.4%). Majority of the study participants were obese according to waist circumference (Male-81.3%, Female-74.2%) (Table 2).

Table 2. Prevalence of Hypertension and Obesity among the study participants

Variable	Frequency (%)
Hypertension	
Yes	66 (27.6)
No	173 (72.4)
BMI	
Underweight (<18.5)	18 (7.5)
Normal range (18.5- 22.9)	67(28.0)
Overweight (≥23)	154 (64.4)
Waist circumference	
Men (≥90 cm)	87 (81.3)
Female (≥80 cm)	98 (74.2)

Factors such as presence of hypertension, moderate work, education till primary and high school education had higher odds of having obesity (Table 3). While male gender was a protective factor for obesity. Statistical significant association was not found between hypertension and independent factors.

Table 3. Association between Socio-demographic and other factors and Obesity

Factors	Odds ratio	P value
Male	0.301	0.045
Presence of hypertension	3.40	0.033
Moderate worker	5.97	0.01
Primary school Education	8.44	0.012
High school education	4.33	0.028

Discussion

This study was conducted among 239 patients attending medical OPD for various reasons. Patients 30 and above with no history of hypertension were recruited in the study. Hypertension was seen among 27.6% of the study participants.

Other study reported the prevalence of hypertension to be 17%, 17.9%, 21.5%, while another study reported it to be 41.3%.[5,9–11] Hypertension is a risk factor for cardiovascular diseases. The presence of this health condition may go unnoticed for long years, while opportunistic screening is simple, yet efficient method for screening hypertension. Patients attending for any medical ailments, blood pressure should be mandatorily be checked without missing a single patient.

More than half of the study participants belonged to the category of overweight according to BMI (64.4%) and majority of them fall into obese category according to waist circumference (Male-81.3%, Female-74.2%). The prevalence of obesity is found to be high in the present study. This study used WHO Asia pacific classification, which has lower cut-off value for Asians compared to standard WHO classification for obesity. A study reported that 46.1% hypertensive participants had generalized obesity, while prehypertensive and normotensive participants, 36.9% and 21.5% had obesity.[10] However another study reported that BMI was $\geq$ 25 in 18 % and $\geq$ 30 in 3.2% men and women, prevalence is lower compared to the present study.[12] Obesity is a risk factors for several disease like Cardiovascular diseases, Diabetes, Cancer, Dementia, etc. It is important to screen all the patients attending health care facility for obesity and educate the patients about the health problem that may potentially arise due to obesity.

Presence of hypertension, moderate work, education till primary school and high school was found to be associated with Obesity. While male gender was a protective factor.

A study reported that prevalence of abdominal obesity in Indians according to NFHS-5 was 40% in women and 12% in men.[13] Obesity is a major risk factor for essential hypertension.[14] Conversely obesity and hypertension, both are independent risk factors for cardiovascular diseases. Lower physical activity due to sedentary lifestyle is associated with obesity, while the present study found that moderate work was found to be associated with obesity.[15] A study reported that lower education level (Primary school) is 1.5 times more associated with obesity, similar to the present study.[16]

Conclusion

Hypertension was seen among 27.6% of the study participants. More than half of the study participants were overweight and majority of them were obese according to BMI and waist circumference. Opportunistic screening is a simple and yet efficient method for screening patients for Hypertension and Obesity. Management of these two important risk factors at early stage will help in preventing cardiovascular events among the patients in the future.

Acknowledgement

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