e-ISSN: 0976-822X, p-ISSN:2961-6042

Available online on http://www.ijcpr.com/

International Journal of Current Pharmaceutical Review and Research 2025; 17(7); 1970-1973

Original Research Article

Body Mass Index and Its Relation to Blood Pressure in The Population of Jharkhand

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Received: 24-05-2025 / Revised: 23-06-2025 / Accepted: 24-07-2025

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Conflict of interest: Nil

Abstract:

Being overweight has potential health risks. Body mass index (BMI) can predict whether you are overweight or have normal weight. Increase in BMI has impact on cardiovascular risks. This study was done to examine the relationship of BMI and hypertension in the population of Jharkhand. The participates visiting outpatient department for some other causes and not related to heart disease were included and were divided into 4 groups according to the age (41-50), (51-60), (61-70), (71-80). It was observed that BMI is increased in all the age groups and all the participants were found to be hypertensive and were unaware of their condition. Increased BMI shows that it's a risk factor for hypertension.

Introduction

Body Mass Index is used for determining a person being overweight or obese and in turn predicts the morbidity and mortality for cardiovascular diseases (CVD). Countries like UK, USA and other developed countries the death rate is around 15%. [1-3] due to CVD. It has been found that South Asians, who migrated from rural to urban areas have greater prevalence of obesity and lower level of physical activity when compared to rural population. [4,5] The relationship between BMI and coronary heart disease (CHD) may differ in incidence as well as fatality.[6-8] There is unclear data stating any relation between BMI and incident CHD whether varies by age [9,10] or by lifestyle risk factors hence large-scale prospective studies may be needed to provide for the incident CHD across a wide range of BMI in the population across important subgroups. [11] Obesity and CVD are mediated by hypertension, dyslipidemia, diabetes among other conditions. [12,13] Elevated BMI fluctuation may lead to changes in blood pressure (BP), heart rate imposing stress on the cardiovascular system. [14] According to WHO 46% of adults are unaware that they are having hypertension. [15]

Classification of Body Mass Index according to WHO [16,17]

Classification	BMI (kg/m^2)
Underweight	≤18.5
Normal range	18.50 – 24.9
Overweight	25.00 – 29.9
Obese class 1	30-34.9
Obese class 2	35-39.9
Obese class 3	≥40

Classification of hypertension according to American Heart Association [18]

Blood pressure Category	Systolic BP (mm of Hg)	Diastolic BP (mm of Hg)
Normal	< 120	< 80
Elevated	120-129	< 80
Stage 1	130-139	80-89
Stage 2	140 or >140	>90
Hypertensive crisis	>180	>120

This study was done in order to see the relationship of BMI and hypertension in people of Jharkhand who accidentally became aware of their high BP during their visit to the outpatient department.

Method

Study participants: For this study patients aged between 30-60 years visiting for the first time diagnosed with HTN were included. Patients coming for follow-up for CVD and with serious physical ailments and also participants with family history with hypertension (HTN) were excluded from the study. Patients belonging to low socioeconomic classes were excluded. Thirty patients were included in each group (41-50 years,51-60 and 60-70 years). Written informed consent was taken from the patients before collecting the data. The data was collected over a period of two years.

Measurements taken for calculating BMI and Blood Pressure: Physical measurements weight expressed in kilograms (kg), and height expressed in metres (m) were taken. Weight was taken with a weighing scale with the shoes removed. Height was recorded from sole to the top of head with the participant standing erect and looking straight ahead with the help of stadiometer. Body Mass Index was calculated as weight÷height^2.

BP was measured using a digital automated BP monitor (Omron HEM 7120). Participants rested for at least 10 minutes and then two blood pressure readings were taken 5 minutes apart. Patients lifestyle including their physical activity was also recorded.

Result

Body mass index categorizes individuals as being normal weight, overweight and obese. In the present study 80 patients were included to see relation between BMI and blood pressure. The patient had visited OPD for usual symptoms such as fatigue, weakness, headache, not able to sleep etc. All the patients had no hypertension previously or had any family history. The physical activity was found to be limited to daily chores. No patient had any physical exercise done routinely or occasionally. Each one of the participated showed some kind of stress in their life which included family and workplace stress.

The patients were divided into 4 groups with 20 in each group. Their BMI and blood pressure according to the age group has been summarised in the table number 1. In our study it was observed that people are of normal and overweight BMI. Each age group had increased blood pressure.

Table 1: Mean BMI and Blood pressure (BP) for each age group

Age group	BMI (kg/m2)	Category (BMI)	Systolic BP	Diastolic BP
41-50	24.88 (± 2)	Normal	149 (± 7)	91(± 6)
51-60	25.21(± 4)	Overweight	145 (± 20)	90 (± 9)
61-70	25.98 (± 4)	Overweight	154 (± 9)	91 (± 7)
71-80	25.54 (± 4)	Overweight	155 (± 11)	92 (±7)

Discussion

Hypertension is one of the serious health problems in the world. [19,20] It is a silent killer as in its early stages rarely symptoms appear and when severe medical crisis occurs, like heart attack, stroke, or chronic kidney disease it can only be diagnosed [21,22]. The number of adults with hypertension increased and the increase was observed mainly in the low-and middle-income countries. [21] Usually, people are unaware of high blood pressure. The only way to detect hypertension is by a health professional or it can be done through automated devices by oneself at home. In our present study the patients were unaware of their increased blood pressure when they had visited the out-patient department.

Prevalence of hypertension increases as the age increases. [23] Both being overweight and obese are associated with cardiovascular disease risk factors and also increased cardiovascular events [24,25]. In the present study it was observed that as age is advancing BMI is also increasing and with that the people are having increase in their blood pressure which they themselves are unaware of.

In Europe an interventional study done in hypertensive population identified an increased risk of cardiovascular mortality in thin and moderate to-severely obese people having hypertension. [26]. BMI is being used widely to predict cardiovascular outcomes.

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