Original Article

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Association of BMI with Hypertension among the Selective Patients in Chattogram

Mohammed Akram Hossain[1*] Mohammed Ibrahim Chowdhury[2] Md Saifudddin Azad[3]
MSI Tipu Chowdhury[4] Kishuar Nasrin[1] Rajiv Dey[4] ABK Bashiruddin[5] Mohammed Noorul Azim[6]

ABSTRACT

Background: *Body Mass Index is one of the significant determinant associated with many disease process particularly hypertension. There is positive association between Body Mass Index (BMI) and Blood Pressure (BP). Lowering BMI with weight reduction significantly reduces Blood Pressure (BP). The main purpose of this study was to find out the association of BMI with hypertension. The aim of the study is to find out any association between BMI and hypertension in Chattogram.*

Materials and methods: *It was a cross sectional study done from June to December 2023 in private chamber among hypertensive patients aged 20 years and above. 188 hypertensive patients were included in the study. BMI was calculated by a person's weight in kilograms divided by height in meters squared.*

Results: *In this study-it is observed that majority 125(66.4%) of the patients belonged to age between 40-70 years, 104(52%) were male, 18(9%) were graduates and 95(47%) were service holder. Out of 188 hypertensive patients, 77(38.5%) were overweight and 26(13%) were obese.*

Conclusion: *High BMI increases the risk of HTN.*

Key words: Blood pressure; BMI; hypertension; Obesity; Overweight.

Introduction

Hypertension is common in day to day practice. Many patients with hypertension are obese. Many studies were done to see correlation between obesity and hypertension. Few were done in patients residing in northern districts of Bangladesh. There was a positive correlation between Body Mass Index (BMI) and Blood Pressure (BP). This association has critical implications. In countries like China, where high blood pressure and obesity is increasing.[1] Blood pressure can be reduced significantly with control of obesity.[2] Obesity is not only a factor associated with high BP, but also a cause.[3] Hypertension has proved to be a recognized cause of morbidity and deaths worldwide.[4] In developing countries like Bangladesh, hypertension is an emerging major public health problem.[5] One quarter of world adult population is already hypertensive and most of them are in developing countries.[6] According to an extensive survey on non-communicable disease conducted in 2010, prevalence of hypertension is 17.9%.[7] Exact prevalence of HTN in Bangladesh was not known. One meta-analysis and a population-based survey found the prevalence 11.3% and 18.6% respectively.[8- 9] In another survey, the prevalence was 20.1%.[10]

'Prevention is better', this is particularly true for hypertension. This study observe if there was association between BMI and hypertension. So finding the association between BMI and HTN might help prevent HTN and its many complications. Though Bangladesh is a small country, it has nearly 200 million population. Out of them, many suffers from hypertension and its complications. Bangladesh is a developing country with overwhelming impact on healthcare system. Once hypertension developed, it requires long term medication with increased cumulative cost. A large number of people are not able to continue the treatment of hypertension due to financial constraints. Many study found clear association between increased BMI and hypertension. Very few studies done in Chattogram. This study purpose is to find association between BMI and hypertension among people living in the study area.

1. Senior Consultant of Cardiology
Chattogram General Hospital, Chattogram.
2. Associate Professor of Cardiology
Chittagong Medical College, Chattogram.
3. Assistant Professor of Cardiology
Chattagram Maa-O-Sishu General Hospital, Chattogram.
4. Junior Consultant of Cardiology
Chattogram General Hospital, Chattogram.
5. Medical Officer
Bangladesh Institute of Tropical & Infectious Diseases. Chattogram.
6. Assistant Professor of Community Medicine
Institute of Applied Health Sciences.
*Correspondence : **Dr. Mohammed Akram Hossain**
Cell : +88 01716 14 18 34
Email : drrumang@gmail.com

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Materials and methods

This was a cross sectional study performed during the period June to December 2023 on 188 selected patients by convenience type of non probability sampling technique. Those who had come for treatment purpose, male and female were included in the study. Unwilling patients and severe sick category sufferer were discarded from the research.

Result

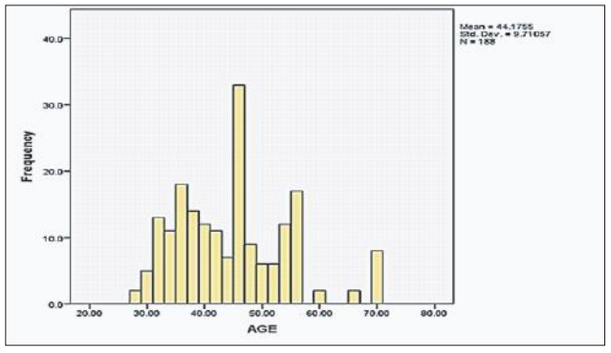

Figure 1 Age of the patients (n=188)

The study reveals that majority 125(66.4%) of the patients belonged to age 40 years and above.

Table I Socio demographic profile (n=188)

Variable	Frequency	Percentage (%)
Gender		
Male	104	55.32
Female	84	44.68
Education		
Illiterate	11	5.85
Primary	62	32.98
SSC	42	22.34
HSC	55	29.26
Graduate & above	18	9.57
Occupation		
Service holder	95	50.53
Daily labor	48	25.53
House wife	17	9.04
Business men	28	14.90

The study depicts that 104(52.4%) were females, 11(5.5%) were illiterate, 18(9%) were graduates, 95(50.53%) were service holder and 48(25.53%) were daily labor.

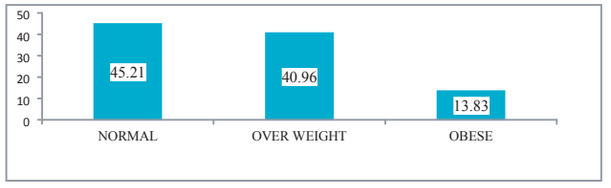

Figure 2 Distribution of patients according to BMI status (n=188)

The study revealed that 85(45.21%) of patients had normal BMI, 77(40.96%) over weight and 26(13.83%) were obese.

Table II Association between BMI and blood pressure

Mean BMI	Mean SBP	Mean DBP
29.60±2.4	141.43±21.75	104.76±23.56
p value	0.023	0.005

The study showed that blood pressure is significantly associated with BMI (p<0.005)

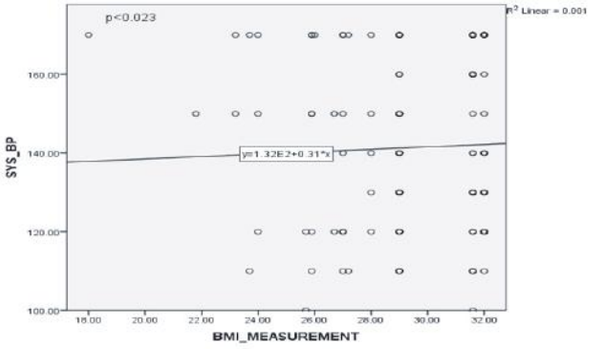

Figure 3 Scatter diagram expressing relation between systolic blood pressure (SBP) and BMI

The study shows positive association as BMI increases, SBP increases. (p<.023)

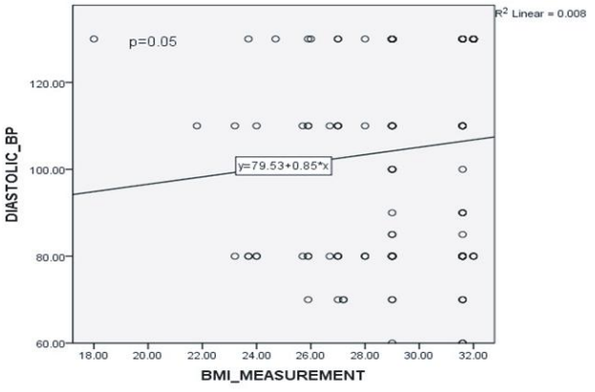

Figure 4 Scatter diagram showing association between diastolic blood pressure and BMI (n=188)

The study showing positive association as DBP increases, BMI also increases.

Discussion

The aim of this study was to explore the association between increased weight and blood pressure among hypertensive patients. In this study, positive association was seen between high BMI and blood pressure among the patients. Both systolic and diastolic blood pressure is high as BMI increases. In this study majority 125(66%) of the patients were in the age between 40

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years and 70 years, whereas in a similar study done in Rangpur majority of patients belonged to age group 41 to 50 years.[10] In the current study it was observed that 104(52%) were males and 84(48%) were females. Meanwhile in another study by Alamgir, it was observed 30% were females and 70% were males.[11] Taking education into consideration in this study, it was observed that 11(5.85%) were illiterate, 18(9.57%) were graduates, whereas in another similar study 11% were illiterate.[10] Considering occupation wise in this current study it was observed that 95(50.53%) were service holder which corresponds to study done by Islam.[12] BMI classification revealed 45.2% were within normal range of weight, 40.96% were overweight and 13.83% were obese. Whereas in the study done in Rangpur by Rahman et al. it is observed that BMI distribution revealed underweight, healthy weight, overweight and obese 4.6%, 46.5%, 38.7% and 10.2% respectively.[10] This study revealed strong association between BMI and SBP or DBP among the participants. Both SBP and DBP increased significantly as the BMI increased. Overweight or obese subjects were more likely to have higher SBP or DBP compared to healthy weight subjects. Mean value of BMI, SBP and DBP were 29.60 ±2.4, 141.43 ±21.75 and 104.76 ±23.56 respectively. The association between SBP and DBP with hypertension shows significant positive association (p value= 0.023, p value=0.005). This finding is similar to another study done by Esha Shrestha et al.[13] Overweight/obesity among the participants might be due to less physical activity, high fat intake, sweetened beverages, familial obesity, less fruits and vegetables intake. Various studies revealed diet, physical activity and self-discipline are major factors influencing obesity and HTN. The prevalence of HTN and obesity are significant public health problem and the trend is increasing globally. It is important that there is a need for nationwide campaign for control of weight and obesity. There is specification that measurement of blood pressure and BMI and timely diagnosis and control are essential for all particularly overweight/ obese people.

Limitation

The limitation of our study was that data were collected from a single centre. Further multicentre study is recommended for validation of present study. Sample were taken by purposive method in which question of personal biasness might arise.

Conclusion

There was a positive correlation between HTN and increased BMI. So, we recommended measures to reduce overweight or obesity to prevent HTN and its negative consequences.

Recommendation

A large scale, preferably, nationwide survey should be conducted to reach to a definitive conclusion.

Disclosure

All the authors declared no competing interest.

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