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BMI Status in Hypertensive Patients: Study in a district level hospital, Rangpur, Bangladesh

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Abstract **Original Research Article**

Introduction: Coronary and cardiovascular illnesses are among the leading causes of death globally. Cardiovascular illnesses have several causes and risk factors, one of which is hypertension, often known as high blood pressure. It is one of the illnesses for which there are no obvious symptoms or a cure. As a result, it is frequently identified in its advanced form, with severe symptoms. Socioeconomic variables, among many others, are one of the causes of hypertension. However, the specific relationship between socioeconomic level and hypertension has not been determined, as numerous researches provide contradictory results. Body weight has often been connected to hypertension and cardiac damage, and the present study was conducted to observe the. ***Aim of the study:*** The aim of the study was to observe and evaluate the effects of body weight in select hypertensive patients. ***Methods:*** This was a cross-sectional analytical study conducted at the Department of Medicine, Rangpur Medical college Hospital, Rangpur, Bangladesh during the period from January 2016 to December 2016. The study was conducted with 252 participants selected by random selection method among the participants admitted into the study hospital. The study only contained participants of Hypertension Stage 1 or above. ***Result:*** The age range of the participants was from 18-67 years, with 57.14% belonging to the age group of 21-39 years. The male: female ratio was 5.14:1. 67.86% of the participants had a sedentary work life, and 46.03% of the participants were overweight, with only 8.73% being obese. Excessive salt intake, family history of hypertension and smoking were some of the major additional risk factors. A good level of knowledge regarding HTN was present in only 50% of the participants, with excellent knowledge present in 13.10%. ***Conclusion:*** Increasing bodyweight has a positive relation with hypertension prevalence, and leading a sedentary lifestyle also increases the risk of hypertension. The male population are at a much higher risk of hypertension then women, and a lack of knowledge regarding hypertension plays a big role in an increased incidence rate.

Keywords: Cardiac, Hypertension, Blood-pressure, BMI, Obesity

INTRODUCTION

Hypertension, often known as high or increased blood pressure, is a condition in which the blood vessels' pressure remains elevated for an extended period of time. The vessels transport blood from the heart to all areas of the body. Globally, hypertension is growing more frequent. Nearly half of all individuals in the United States have high blood pressure, yet many are unaware of it [1]. It has been observed that hypertension is more prevalent in the developed countries compared to the developing countries [2]. Hypertension, or a rise in blood pressure, can be caused by many stress related factors, along with dietary habits. This might have influenced the higher prevalence of hypertension in developed countries, with higher standard of life, unhealthy dietary habits, pressure to maintain a certain standard of life etc. Hypertension is recognized as a modifiable risk factor for cardiovascular diseases. Elevated blood pressure causes long-term damage to the heart and other organs, which can lead to potentially fatal consequences. This

damage frequently begins at the cellular and subcellular levels [3]. Hypertension is linked to the majority of cardiovascular and cerebrovascular disorders [4-6]. Although hypertension has a larger frequency in developed nations, the prevalence of hypertension has altered over the previous several decades, particularly in the last 30 years, due to economic expansion and urbanization in many developing countries, including Bangladesh [7]. To decrease the incidence of cardiac disease globally, hypertension needs to addressed seriously, and knowledge regarding the management of hypertension needs to be widespread. The Joint National Committee 7 (JNC7) defines normal blood pressure as systolic blood pressure of 120 mmHg and diastolic blood pressure of 80 mmHg. Hypertension is defined as a systolic blood pressure of 140 mmHg and/or a diastolic blood pressure of 90 mmHg. Prehypertension is described as a grey region between 120–139 mmHg systolic BP and 80–89 mmHg diastolic BP [8, 9]. Although prehypertension is not generally recognized as a real medical condition, prehypertension patients are much more likely to develop HTN later in life [10]. It is a silent killer since no symptoms are visible in the early stages until a serious medical crisis occurs, such as a heart attack, stroke, or chronic renal failure. Because most people are unaware of their high blood pressure, only measures can be used to detect it. Although the majority of hypertensive individuals are asymptomatic, some suffer from headaches, lightheadedness, vertigo, impaired vision, or fainting episodes [11]. There are numerous risk factors for hypertension. These characteristics change from nation to country, and even within the same country, there are differences between urban and rural areas [12]. But one of the common risk factors for hypertension observed all over the world is dietary habits and high BMI levels. Obesity is also a risk factor for diabetes [13]. The present study was conducted to evaluate the association of BMI levels with hypertension (HTN) patients.

OBJECTIVE

General Objective

- To evaluate the BMI levels of hypertensive patients

METHODS

This was a cross-sectional analytical study conducted at the Department of Medicine, Rangpur Medical college Hospital, Rangpur, Bangladesh during the period from January 2016 to December 2016. The study was conducted with 252 participants selected by random selection method among the participants admitted into the study hospital. The participants were selected following the inclusion and exclusion criteria, and all necessary data were recorded in a predetermined questionnaire. Informed written consent was taken from each participant before recording their data, and ethical approval was obtained from the ethics review committee of the hospital.

Inclusion Criteria

- Patients over the age of 17
- Patients who had given consent to participate in the study.
- Patients with hypertension stage 1 or above

Exclusion Criteria

- Pre-hypertensive patients
- Mentally ill.
- Unable to answer the criteria question.
- Exclude those affected with other chronic diseases etc.

RESULTS

The age range of the participants was from 18-67 years, with 57.14% belonging to the age group of 21-39 years. The male: female ratio was 5.14:1. The occupation of the participants were diverse, with only 4.37% being day-laborers. 67.86% of the participants had a sedentary work life, and 46.03% of the participants were overweight, with only 8.73% being obese. Excessive salt intake, family history of hypertension and smoking were some of the major additional risk factors. Over half the participants had Stage 1 hypertension, and a good level of knowledge regarding HTN was present in only 50% of the participants, with excellent knowledge present in 13.10%.

Table 1: Age distribution of the participants

Age Group	Frequency	Percentage
18-20	7	2.78%
21-39	144	57.14%
40-59	91	36.11%
≥60	10	3.97%

Majority of the participants (57.14%) were from the age group of 21-39 years, and another 36.11% were from the age group of 40-59 years. Only 3.97% were of 60 years or older, and 2.78% were younger than 20 years. The age range of the participants was 18-67 years.

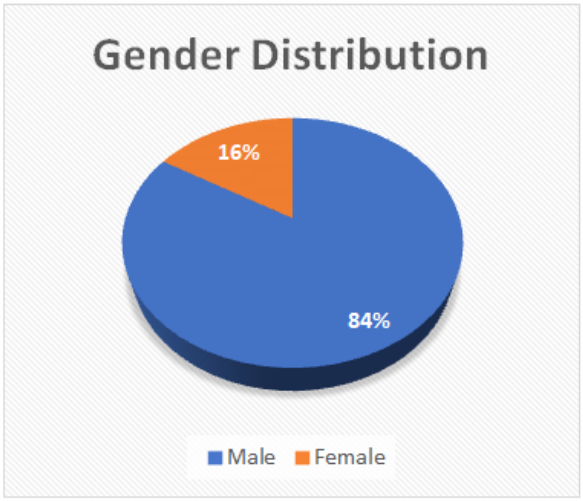

Figure 1: Gender distribution of the participants

Among the participants, an overwhelming male predominance was observed, with 83.73% male and only 16.27% female. The male population was over 5 times larger than the female population, and the male: female ratio was 5.14:1.

Table 2: Occupation distribution of the participants

Occupation	Frequency	Percentage
Service	92	36.51%
Business	57	22.62%
Housewife	32	12.70%
Student	60	23.81%
Day-Laborer	11	4.37%

The maximum number of participants (36.51%) worked in the service industry. 22.62% were businessman, 12.70% were housewives, 23.81% were students, and 4.37% were day-laborers.

Table 3: Physical activity levels of the participants

Physical Activity Level	Frequency	Percentage
Sedentary Worker	171	67.86%
Moderate Worker	71	28.17%
Heavy Worker	10	3.97%

It was observed that over half the participants (67.86%) were involved in a sedentary workstyle and lifestyle. 28.17% had a moderate workstyle, and 3.97% were heavy workers.

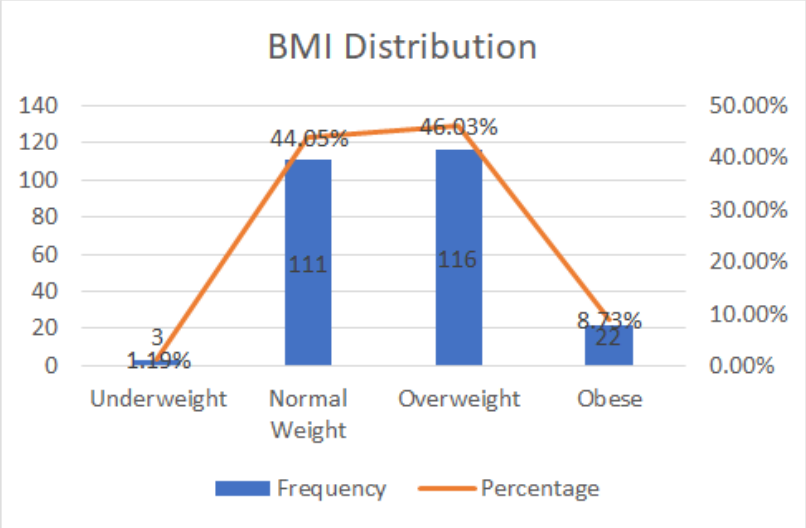

Figure 2: BMI distribution of the participants

Majority of the participants (46.03%) were from the overweight category, with almost similar number of participants (44.05%) belonging to the normal weight category. 8.73% of the participants were from the obese category, and only 1.19% were from the underweight category.

Table 4: Risk factor distribution of the participants

Other Risk Factors	Frequency	Percentage
Smoking	69	27.38%
Excessive Salt Intake	94	37.30%
Family History of HTN	81	32.14%
OCP	5	1.98%
Steroid	3	1.19%

Other than BMI, excessive salt intake was a risk factor for 37.30% of the participants, and smoking was present as a risk factor for 27.38% of the participants. 32.14% of the participants had a family history of hypertension, 1.98% had oral contraceptive pills as a risk factor, and 1.19% had steroid use as a risk factor.

Table 5: HTN stage distribution of the participants

Hypertension Stage	Frequency	Percentage
Stage 1	132	52.38%
Stage 2	120	47.62%

Among the participants, over half the participants (52.38%) had stage 1 hypertension, while the remaining 47.62% had stage 2 hypertension.

Table 6: Awareness levels of the participants

Awareness Levels	Frequency	Percentage
Excellent	33	13.10%
Good	126	50.00%
Adequate	63	25.00%
Poor	30	11.90%

Excellent awareness regarding hypertension was present in only 13.10% of the participants, while half the participants (50%) had good awareness. 25% of the participants had basic, or adequate levels of awareness, and 11.90% had very poor awareness regarding hypertension.

DISCUSSION

One of the primary risk factors for cardiovascular disease is hypertension, often known as high blood pressure. Because there are no treatments for hypertension, people must live the remainder of their lives on medications. It is the third leading cause of patients' disability-adjusted lifestyle. One of the most hazardous aspects of hypertension is that it has no specific symptoms, thus many individuals go untreated for the rest of their lives [1]. The only way to combat this is through frequent medical check-ups, which are out of reach for many people in both poor and wealthy countries. Even in the United States, over half of the adult population has hypertension [1]. Many studies have been conducted to observe the predetermining factors of hypertension, both physical and sociological. The results of these studies are often conflicting for some factors, mainly due to the difference in environmental and lifestyle factors [14]. The present study was conducted with the aim of observing and evaluating the BMI status of the participants, along with its relation to other factors. In the present study, the age of the participants ranged from 18 to 67 years, and it was observed that majority of the participants belonged to the age group of 20-39 years, and the second highest number of participants belonged to the following age group of 40-59 years. The peak age of hypertensive patients was similar to other studies, but in majority of such studies, the incidence of hypertension increased further with age [15, 16]. This difference might be due to our small sample size, and the lack of knowledge regarding hypertension among the general population. An overwhelming number of the present participants were male, with only 16% female prevalence. This male predominance has been observed in a majority of the world's studies [17-19]. This is thought to be a result of the hormonal difference between male and female, and higher level of awareness among the female population. It was observed that maximum number of the participants had occupations that did not require much physical labor. Only 4.37% of the participants were day-laborers, and 12.70% were housewives. 67.86% of the participants were sedentary workers, 28.17% had a moderate workstyle, and 3.97% were heavy workers. This points to the fact that leading an active lifestyle reduces the risk of high blood pressure. This is also supported by other studies [20, 21]. The patients BMI levels were recorded and measured according to their age and gender. By the BMI range definitions of WHO, the participants were divided into underweight, normal weight, overweight and obese categories. It was

observed that 44.05% were of normal weight, and 46.03% were of overweight category. 8.73% of the participants were from the obese category, and only 1.19% were underweight. This supports the theory that HTN prevalence increases along with body weight and obesity [22, 23]. Research has also discovered that hypertension can be directly induced by obesity [24]. Although in the present study, very few participants were from the obese category, maximum number of participants were from the overweight category. This might be due to the difference of lifestyle of the participants, the overall lack of willingness to seek medical help, combined with lack of adequate knowledge regarding hypertension. It was observed that only 13.10% of the participants had excellent knowledge of hypertension, and 50% had good awareness. 25% of the participants had only the basic knowledge regarding HTN, and 11.90% had poor knowledge regarding the topic. The lack of knowledge played a role in the high prevalence of overweight participants, along with other risk factors. It was observed that excessive salt intake and family history of HTN were the predominant additional risk factors. Smoking was also observed as a high-risk factor in 27.38%. This was somewhat different from other studies, where smoking was often seen as the biggest risk factor for both hypertension and cardiovascular disease [25, 26]. The present study only selected hypertension stage 1 and above patients. 52.38% of the participants were of stage 1 category, and the remaining 47.62% had stage 2 hypertension. There was no significance between these groups.

Limitations of the Study

The study was conducted in a single hospital with small sample size. So, the results may not represent the whole community**.**

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Conflict of interest: None declared.

Ethical approval: The study was approved by the Institutional Ethics Committee.

CONCLUSION

The Increasing bodyweight has a positive relation with hypertension prevalence, and leading a sedentary lifestyle also increases the risk of hypertension. The male population are at a much higher risk of hypertension then women, and a lack of knowledge regarding hypertension plays a big role in an increased incidence rate. Hypertension has genetic effects, as a family history of hypertension increases the risk of incidence in the following generation.

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