

Original research article

A STUDY ON HYPERTENSION AND OBESITY IN EARLY ADULT FEMALES

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Abstract

Obesity and hypertension are becoming prevalent among young adults and adolescents in India. The increase in this phenomenon is attributed to alterations in dietary patterns, such as the greater use of processed food, as well as a sedentary way of life. Hypertension that begins during childhood or adolescence persists into maturity. The objective of this study was to determine the frequency of obesity and hypertension among females between the ages of 18 and 20.

Keywords: Hypertension, obesity, adult, females

Introduction

In 2015, the Global Burden of Disease data reported an increase in hypertension cases in India ^[1]. According to predictions, there was expected to be a 111% rise in cardiovascular mortality in India by the year 2020 ^[2]. Hypertension is commonly referred to as a "silent killer" due to the fact that a large majority of individuals with hypertension experience no noticeable symptoms. Individuals afflicted with hypertension commonly experience symptoms such as headache, dyspnea, vertigo, angina, and cardiac palpitations. Hypertension can originate during infancy and adolescence, although it may remain undiagnosed due to the lack of observable signs and symptoms ^[3,4].

Obesity has been linked to hypertension in Asian adolescents ^[5]. Over the past twenty years, there has been a global decrease in physical activity and a shift in food habits ^[6]. Engaging in physical activity is regarded as crucial for preventing hypertension in adolescents. The World Health Organisation (WHO) has advised that individuals between the ages of 18 and 64 engage in 30 minutes of physical exercise, five times a week, in order to reduce the risk of non-communicable diseases ^[7-16].

There has been a rise in the occurrence of hypertension among teenagers and older children ^[8]. This phenomenon can be ascribed to the increase in obesity, which is caused by altered food choices and reduced physical activity ^[9]. Table 1 displays research conducted on children diagnosed with HT. The studies demonstrate an increase in the occurrence of pre-hypertension and hypertension in young children and adolescents, with the prevalence rising from 8.5% in 2006 to 20.2% in 2017. This study

was undertaken with the objective of determining the prevalence of obesity and hypertension in adult females.

Materials and Methods

This study was conducted using a cross-sectional design and included a sample of 450 adult females. The study aimed to compute the body mass index (BMI) and measure blood pressure using a digital sphygmomanometer. Additionally, it sought to examine the correlation between BMI and hypertension. The participants fell within the age range of 18 to 20 years.

The concept of Inclusion-Exclusion Standards: The study comprised females who were between 18 and 20 years old. The study excluded those who had already been diagnosed with hypertension.

Information was gathered through the use of a questionnaire. Prior to posing any inquiries to the participants, the objective of the study was elucidated and their written agreement was gained. The questionnaire encompassed inquiries on basic information, anthropometric measurements, and blood pressure assessments. The questionnaire also incorporated inquiries about physical exercise.

Measurement of blood pressure was conducted using a digital sphygmomanometer. The blood pressure (BP) was categorised according to the guidelines provided by the American College of Cardiology and American Heart Association Task Force. Table 2 displays the categorization of blood pressure.

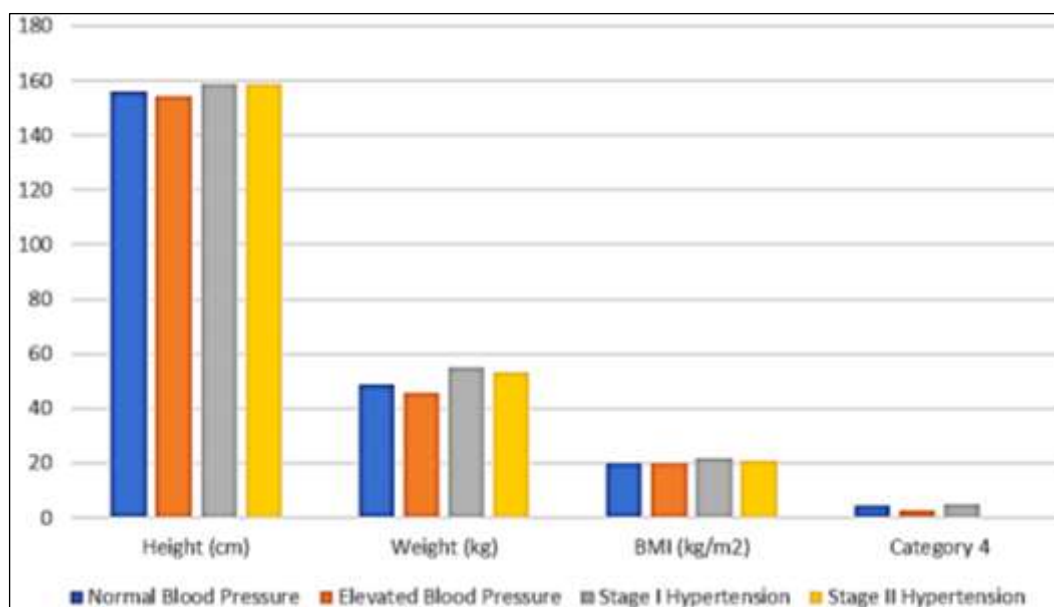
Results

Table 1: Blood pressure

Category	Systolic Blood Pressure (mmHg)	Diastolic Blood Pressure (mmHg)	Frequency
Normal blood pressure	<120	<80	398
Elevated blood pressure	120-129	<80	47
Hypertension stage 1	130 – 139	80-89	3
Hypertension stage 2	≥140	≥90	2

Table 2: BMI and Hypertension

Parameter	Normal Blood Pressure	Elevated Blood Pressure	Stage I Hypertension	Stage II Hypertension
Height (cm)	156.20 ± 3.48	154.22 ± 4.48	158.73 ± 3.83	158.60 ± 8.3
Weight (kg)	48.77 ± 9.64	45.75 ± 8.37	55.18 ± 1.92	53.22 ± 8.72
BMI (kg/m ²)	19.99 ± 1.38	19.84 ± 3.48	21.65 ± 2.47	21.06 ± 3.84



Graph 1: BMI and Hypertension

Discussion

Prior research has documented reduced proportions of females in the obese or overweight classification. In a cross-sectional study conducted in Wardha, it was shown that over 50% of the female participants had an average BMI of 18.8 ± 6.08 kg/m², whereas only 5.2% were classified as obese^[17]. In a similar vein, a study conducted in Hyderabad found that a significantly less proportion of females who were overweight (9.38%) and obese (2.60%) were seen compared to the current study. Jain et al. did a study in Central India and obtained same findings in a sample of 196 females aged 17-26 years. They recorded an 8% prevalence of overweight and an 11.3% prevalence of obesity. Conversely, a study conducted in Punjab on 123 females aged 18-50 years found a significant prevalence of obesity, with 22% of the participants being obese^[20]. These findings suggest a progressive rise in obesity over time.

This study also demonstrates the presence of dual burden of malnutrition. The current population consisted of a significant proportion of underweight females (36%), as well as 26% of teenagers who were classified as overweight and obese. Hence, this study demonstrates the existence of a dual burden of malnutrition among the adolescent participants. Experiencing both undernutrition and overnutrition simultaneously raises the likelihood of developing chronic illnesses such as hypertension, diabetes, and cardiovascular disease^[21]. Being underweight might result in weakened immunity and make individuals more susceptible to illnesses^[22]. Urban girls may experience undernutrition as a result of inadequate eating habits, which can lead to a lack of consumption of nutritious and well-balanced meals. A significant number of females who are overweight lead a sedentary lifestyle and have a high intake of unhealthy foods. Therefore, due to multiple causes, the prevalence of dual malnutrition is on the rise in India.

There has been a rise in hypertension among younger age groups as well. An assessment was conducted to determine the prevalence of hypertension (HT) among teenagers in Karnataka. According to their findings, 19.4% of the 748 participants aged

11-19 had a familial history of hypertension (HT). In addition, they observed a noteworthy association between a familial background of hypertension and persons with high blood pressure^[9]. The Lucknow study found that 24.2% of the 1041 subjects were hypertensive^[23]. The study conducted in Uttar Pradesh found that 23.47% of the individuals had a family history of hypertension^[24]. During a study conducted in Assam, it was observed that 96 out of 800 participants had hypertension^[25]. In the Wardha study, out of a total of 958 females aged 6-16 years, 63 were found to have hypertension and 67 were found to have pre-hypertension^[26].

BMI is a valuable tool for assessing nutritional status, specifically in regards to overweight or obesity. Obesity is a contributing factor to the development of hypertension. It inhibits the formation of nitric oxide, which plays a crucial role in vasodilation. Greater body weight leads to elevated resistance to blood flow within the body. Additionally, it stimulates the renin angiotensin system and enhances the synthesis of renin, aldosterone, and angiotensinogen, resulting in elevated blood pressure. Higher BMI is associated with an increased likelihood of elevated systolic blood pressure (SBP) and diastolic blood pressure (DBP)^[27].

The incidence of obesity is higher among teenagers^[28]. Obesity arises from an imbalance between the amount of energy consumed and the amount of energy expended. Obesity can result from poor dietary habits, such as a lack of appropriate food choices, excessive consumption of sugary soft drinks and carbonated beverages, oversized portions, and reduced physical activity. Excessive weight or obesity raises the likelihood of non-communicable diseases in children and young people. Adolescents can lower their blood pressure by engaging in weight loss, engaging in regular physical activity, and reducing their salt intake^[29].

Multiple studies have noted a correlation between excess weight and obesity and the development of hypertension. The Haryana study found a strong association between BMI and both systolic and diastolic blood pressure. Out of the 1080 participants in the study, 18.6% were diagnosed with hypertension^[30]. A cross-sectional study conducted in Berhampur revealed that the majority of subjects had normal blood pressure, while only 3.68% were found to have hypertension. Nevertheless, they discovered a substantial correlation between hormone therapy (HT) and obesity^[13]. Furthermore, a study involving 965 persons under the age of 30 found that 59.2% of participants had hypertension, and there was a significant correlation between body mass index (BMI) and hypertension^[31]. A study conducted in Karnataka on a sample of 1152 young individuals revealed that 45.2% of them had pre-hypertension. Furthermore, the study found a positive correlation between body mass index (BMI) and the likelihood of developing hypertension.

Conclusion

Adhering to a nutritious diet and engaging in regular physical activity are crucial in mitigating the likelihood of obesity and hypertension among young adult females.

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