Age-Related Changes In Blood Pressure Among Young Adults

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Abstract

Blood pressure is the common name for what is technically known as systemic arterial pressure, which is the pressure inside the major arteries that feed the body's circulatory system. This number delineates the systolic and diastolic components of blood pressure. One of the most closely watched clinical markers, blood pressure, is essential in charting treatment progress. The importance of measuring blood pressure stems from the correlation between present blood pressure and the possibility of future health problems. A person's arteries and heart must work harder when blood pressure is high. In the long run, this stress may make the arteries less elastic, less intense, and thicker, all of which are bad. Monitoring a patient's blood pressure is crucial to ensure it doesn't rise to dangerous levels. High blood pressure, often known as HBP, is a severe health problem. The illness is sometimes called "the silent killer" due to the lack of apparent symptoms. For instance, a medical professional may quickly monitor the patient's blood pressure [1, 2].

Keywords: Blood, Pressure, Adults.

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INTRODUCTION

High blood pressure is the leading risk factor for cardiovascular disease or a stroke. Hypertension is a long-term condition that requires constant attention. Receiving detailed information on how to adjust one's lifestyle and how to take medicine is the most significant aspect of obtaining better control of blood pressure and avoiding complications [3].

Controlling one's weight, eating healthily, engaging in regular physical activity, and cutting back on one's use of alcohol, tobacco, and smoking are essential components of an effective cardiovascular risk reduction plan. To effectively treat the rapidly expanding elderly patient population, doctors must learn how ageing affects the body's blood vessels. Myocardial infarction, peripheral coronary artery disease, stroke, aneurysm, and chronic kidney disease are some deadly comorbidities associated with hypertension in this population [4].

It has been proven that hypertension in teenagers is a serious health issue due to its link with an elevated risk of cardiovascular diseases (CVDs) [5]. The frequency of the condition is steadily increasing across all age groups and communities, with the oldest population showing the highest prevalence. However, the fact that the disease is striking younger people at a higher rate is still a big concern for society, given that it affects nearly one-third of US adults. There is a strong correlation between the widespread prevalence of classic risk factors in young people, such as obesity, diabetes mellitus, and renal illness, and the increased risk of hypertension in young adults. Because of this elevated risk, young people are more likely to have future cardiovascular problems, such as increased thickness and mass of the left ventricular wall [6,7].

The purpose of this study was to review young hypertensives who had been referred to our clinic to find the clinical characteristics of their condition and the underlying causes.

In this cross-sectional study, many young patients with a mean age of 25 years were under observation. Their family history was also taken, which recorded data from recently diagnosed hypertensive patients.

First, we examined the prevalence of hypertension and the age-related changes in blood pressure and pulse pressure (PP) to verify the assumption that BP rises steadily with age. The goal of this paper was to detail the range of blood pressure fluctuations seen in a group of seniors investigated both longitudinally (over 9 to 12 years) and cross-sectionally (in the whole sample population) and in those who were not using blood pressure medication.

Clinical measures, such as age, height, weight, and blood pressure, were taken, and questionnaires were also administered.
Questions on the patient’s demographics, medical histories (personal and family), levels of education, and hygiene practices were collected. Cholesterol and triglycerides were measured using blood samples, while salt was measured using a random urine collection over 24 hours.

Over two years, the medical records of every patient between the ages of 15 and 30 were examined. Nobody was turned away from the study. Clinical and laboratory data were collected, as well as investigations into the causes of hypertension and the organ damage caused by hypertension.

The research was carried out by the ethical principles outlined in the Declaration of Helsinki. Before the sample was taken, the patient gave their verbal consent. Furthermore, Baghdad Health Directorate and a local committee on publishing ethics examined and approved the study protocol and patient permission forms. For statistical analysis, the Chi-square test was used to determine any significant differences in resistance or prevalence where appropriate. Differences were considered significant at p < 0.05.

The study collected data from patients aged 50 to 70 to measure the blood pressure changes that occur with age. The standard deviation was 5. The mean age was 57. The majority of patients were male.

We found that about 70% of the patients above 50 years of age and 85% of those above 60 years of age were hypertensive. Their history didn’t reveal any significant cardiovascular issues suggesting that this hypertension was due to age-related changes in the human body. Those changes are hardening the arteries, calcifying the aortic valve, and myocardial modifications, as described below. The mean systolic pressure was about 145 mm of Hg (+/- 5), and the mean diastolic pressure was 90 mm of Hg (+/-) (Table 1).

The Results of demographics, medical histories, and hygiene practices among young hypertensive patients were as follows: Mean age of patients (25.4 years), 64% were Male and 36% were Female. Hypertension from (15 months), Family history of hypertension was 76%, Overweight of patients was 60%, and finally, smoking and drugs among patients was 36%.

We also found that younger patients recently diagnosed with hypertension had many related associations. Most of them had a family history of hypertension or diabetes predisposing them to high blood pressure. Some smoked, which did not significantly relate to high blood pressure. The significant finding was that those with a family history of hypertension were at the highest risk of developing hypertension.

High BP is a normal part of ageing. They are considered a natural consequence of getting older. Systolic blood pressure (SBP) increases by roughly seven mmHg every decade in Western people over 40. According to epidemiological data, the typical SBP is around 140 mmHg by the eighth decade of life. Ageing may be related to a reduction in DBP. SBP and DBP in women are often lower than in men before menopause. SBP in women typically exceeds that in men after menopause. By reaching 70, more than three-quarters of American adults have excessive blood pressure. Understanding why blood pressure increases with age is crucial for treatment. Even after adjusting for other risk factors, higher blood pressure is linked to an elevated risk of cardiovascular disease and renal disease in various populations. Increased blood pressure associated with ageing should be addressed as a top therapeutic priority because hypertension is the leading cause of mortality from cardiovascular disease. Increases in age-related physiological changes include mean arterial pressure, systolic blood pressure, pulse pressure, and the body’s ability to adapt rapidly to shifts in hemodynamics [8,9].

Another aspect of our study was determining hypertension's pathophysiology and prevalence in young adults. This study's results have significant implications for future research and treatment of hypertension in young adults. Most people had essential hypertension, others had secondary hypertension, some had high normal blood pressure, and less than 2% were deemed normotensive [10, 11].

The natural wear and tear on your arteries are part of why your blood pressure will always increase as you age. Atherosclerosis is a disease that comes with getting older. It causes blood vessel lumens to get smaller and blood vessel walls to stiffen. When blood pressure waves travel through the body, the structural changes caused by atherosclerosis, such as a buildup of calcium in the arteries, cause early reflected pressure waves. During diastole, the pressure wave goes back up the aorta. This makes the systolic blood pressure go up. Until age 50, diastolic blood pressure mainly increases because arteriolar resistance increases. The main arteries get stiffer with age, which causes the pulse pressure to go up and the diastolic blood pressure to go down. As major arteries stiffen and the resistance of the arteriolar walls goes up, systolic blood pressure, pulse pressure, and mean arterial pressure all increase dramatically.

Several pathophysiological factors make it harder for the body to respond quickly to changes in blood flow. Some of these pathophysiological causes are changes in the shape and function of the heart and a loss of the body’s ability to control blood pressure on its own. Left ventricular hypertrophy and decreased left ventricular compliance are linked to poor heart function and a reduced ability to respond to high systolic blood pressure in response to stress. Left ventricular hypertrophy is related to both of
these conditions. The autonomic nervous system is vital to keeping blood pressure in check because of the physiological changes that happen when you stand, the loss of volume, and the increased cardiac output that occurs when you are stressed. When the body can’t control blood pressure well, it seriously affects the body’s ability to adapt. Orthostatic hypotension is very common among the elderly. Age-related arterial stiffness is a common health problem [12, 13].

The peripheral arterial system is stiffer in younger people than the central arterial system. As we age, our core arteries become stiffer while our peripheral arteries become less rigid. Reversal and subsequent hardening of the larger main arteries can have various causes. Alterations in the components, an increase in oxidative stress, degenerative cytokines, and vascular dysfunction are all factors that contribute to the decline in arterial structure and function that comes with advancing age. Pronounced components of the ageing process include the disappearance of elastin and collagen accumulation in the skin. The artery wall becomes more rigid if the tissue has more collagen than elastin. The cells that make up the ventricle’s smooth muscle may have also been altered. The heart becomes less elastic due to decreased elastin in the ventricular wall, which increases diastolic filling pressure [14]. Ageing characteristics include reduced left ventricular compliance and a diminished cardiac reserve. The performance of the left ventricle is influenced by three factors: preload, afterload, and contractility. As people age, their hearts get bigger, and monocytes multiply less. There is a hardening and loss of elasticity in the left ventricle. Several processes contribute to ventricular stiffening, including changes in protein structure, higher amounts of inflammatory mediators, and elevated levels of glycation end products [15].

Patients with essential hypertension also had a higher prevalence of obesity and a larger waist circumference but a lower prevalence of hypertensive organ damage, particularly CKD. This suggests that you should consider tailoring your investigation based on what you learn from your patient’s history and physical and the results of specific simple diagnostic tests. Of the secondary causes, over 90% were related to the kidneys, most often Takayasu’s arteritis and renal parenchymal disease. Second, risk factors for hypertension were identified in a sizable fraction of patients [16]. Most patients were overweight or obese; several were using methamphetamines, and a few were on an oral contraceptive containing estrogen. The prevalence of type 2 diabetes was 8%. In light of these results, it is clear that youth-focused educational programs that focus on lifestyle issues to combat obesity and hypertension are essential. One of the primary risk factors for hypertension in young adults is being overweight. However, more than 40% of patients in our group were at a healthy weight, suggesting that additional genetic or environmental factors are at play [17].

We can conclude from this study that the prevalence of hypertension in young people is one of the major concerning factors for our generation as it can increase the probability of comorbidities. Many factors are associated with obesity, with family history being the most critical factor.

Conflicts of Interest
Authors declared they have no conflicts of interest.

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None

REFERENCES
Sabreen Hassan Howaidy et al : Age-Related Changes In Blood Pressure Among Young Adults


Table 1: Clinical characteristics of young hypertensive patients

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<th>Diastolic BP (+/-5)</th>
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