



CLINICAL PROFILE OF YOUNG HYPERTENSIVES: A CROSS-SECTIONAL STUDY FROM NAVI MUMBAI

Internal Medicine

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ABSTRACT

Introduction: India is witnessing a demographic shift with respect to non-communicable diseases. The objective of this study was to evaluate the sociodemographic and clinical features of young hypertensives under 40 years old who came to our hospital. **Methodology:** This cross-sectional observational study was conducted in the Department of Medicine, DY Patil School of Medicine, Navi Mumbai, in which we included adults (aged 18 to 40 years), males and females diagnosed with hypertension as per JNC 8 or on anti-hypertensive treatment. Using a pre-designed semi-structured study proforma, patient demography, presenting complaints, blood pressure measurements and laboratory investigations were noted. **Results:** Mean age of the patients was 27.7 ± 5.27 years. The most common presenting complaint of the patients was headache (65.5%). It was observed that both mean systolic and diastolic blood pressure was lowest in the age group 18 to 25 years and highest in the age group 36 to 40 years (p value < 0.01 for both). Laboratory investigations revealed that mean total cholesterol was 204.88 ± 23.58 mg/dl, ranging from 180 to 271 mg/dl. In addition, mean LDL was 123.58 ± 12.24 mg/dl, ranging from 90 to 158 mm Hg, mean HDL was 41.99 ± 5.81 mg/dl, ranging from 32 to 56 mg/dl and mean triglyceride was 139.51 ± 17.36 mg/dl. **Conclusion:** We conclude that increasing age, low HDL and low physical activity were common risk factors among young hypertensive patients in our study. These findings suggest that public health and medical outreach efforts should be aimed at young individuals to prevent hypertension

KEYWORDS

hypertensive; risk factors; epidemiology

INTRODUCTION

The projected proportion of disability-adjusted life years (DALYs) in India attributable to noncommunicable diseases (NCDs) has grown from 31% in 1990 to 55% in 2016. The community-based cohort investigation of the ongoing Coronary Artery Risk Development in Young Adults (CARDIA) project revealed an increasing incidence of hypertension in the 18–30-year-old group. Long-established risk factors for hypertension in the general population, such as physical inactivity, diabetes, and obesity, which are growing increasingly frequent in the younger population, partly explain the increased prevalence of hypertension in young individuals. The systolic blood pressure response to exercise has been proven to predict the onset of hypertension in young persons. Even after adjusting for age, sex, and other confounding factors, young volunteers aged 20–35 with an exaggerated response to exercise had higher systolic and diastolic blood pressures and were more likely to develop chronic hypertension following a 15-year follow-up.

The majority of young people with uncontrolled hypertension are ignorant of their disease, demonstrating that there are obstacles to hypertension management beyond access to medication. Understanding the particular obstacles faced by young individuals is essential for designing effective hypertension treatments. Other studies have identified sociodemographic characteristics (such as gender, race, ethnicity, and language) as an impediment to hypertension control. The bulk of research, however, have focused on middle-aged and older individuals, as well as younger folks without health insurance and/or a primary care home.

Before policymakers can establish programmes for the management and treatment of hypertension in young people, they need national baseline data. Therefore, the objective of this study was to evaluate the sociodemographic and clinical features of young hypertensives under 40 years old who came to our hospital.

METHODOLOGY

Study Design And Sample Size

This cross-sectional observational study was conducted in the Department of Medicine, DY Patil School of Medicine, Navi Mumbai, in which we included adults (aged 18 to 40 years), males and females diagnosed with hypertension as per JNC 8 or on anti-hypertensive treatment. Pregnant and lactating mothers were excluded from the study. NFHS-4 has reported that the overall country-level prevalence of hypertension among the younger age individuals (men 15–49 years,

women 15–54 years) in India is 11.3% overall. Using this data, the sample size was calculated as: $N = (Z_{\alpha/2})^2 * (PQ) / E^2$, where N = Sample size, $Z_{\alpha/2}$ = Z value at confidence level of 90% (1.64), P = Taken as 11%, $Q = 1 - P$ and E = Allowable error taken as 5%. $N = (1.64)^2 * (0.11 * 0.89) / (0.05)^2$, $N = 105.3$, rounding off to 110. So, a minimum of 110 young hypertensive patients were included in the study. All patients were explained the purpose of this study and an informed written consent was obtained before enrolment.

Data Collection And Data Analysis

Using a pre-designed semi-structured research proforma, data were gathered. Each participant's current and prior medical history was meticulously documented, including their name, age, gender, residence, employment, socioeconomic position, education, medications, and medical history indicative of any systemic disease. Each subject was then evaluated for a range of anthropometric parameters: The subject's mass (in kilogrammes) and height (in metres) were determined (using Omron digital body weight scale and wall mounted metal tapes respectively). The Body Mass Index (BMI) was calculated using the formula: weight (Kg)/height squared (m²) (WHO Expert Consultation, 2004). The body mass index was categorised as underweight (BMI 18.5), normal (BMI 18.5 to 23), overweight (BMI 23 to 27.5), and obese (BMI 27.5) according to World Health Organization guidelines for the south east Asian population. The phrase "hypertension therapy" refers to the prescription medication now used to treat hypertension in hypertensive individuals. Pharmacological treatment was the only alternative considered. Only if the individual had previously been diagnosed with hypertension and was taking antihypertensive medication was a treatment history acquired. This was done to avoid misclassification of normotensive patients who were taking cardiovascular drugs for causes other than hypertension. The treating physician requested laboratory tests deemed necessary for secondary hypertension diagnosis. The primary investigator obtained two blood pressure readings throughout the interview. If the difference between the two readings is more than 10 mm Hg, a third reading is taken and the average of the three readings is used to calculate the blood pressure. The blood pressure was determined using a standardised method. The blood pressure was taken with the legs uncrossed and the patient seated on the floor. Using the left arm, the blood pressure was measured. Only if the left arm exhibited low pulse or the patient had left-sided paresis was the right arm used. It was found that the patient had not smoked nor eaten coffee during the preceding 30 minutes. If so, the recording of BP would be postponed forever. The mean of two (or three, if specified)

SBP measures and the mean of two DBP measurements were calculated and used, respectively, as the mean SBP and DBP. Using the criteria established by the Eighth Joint National Committee (JNC 8), hypertension was diagnosed.

Means and standard deviations were used in the descriptive analysis of quantitative parameter and ordinal data were reported in absolute and percentage terms. Mean blood pressures across different age groups were compared using one-way ANOVA test, with a p-value of less than 0.05 considered as statistically significant. SPSS software, version 25.0, was used for statistical analyses.

RESULTS

In the present study, 110 patients were included. Mean age of the patients was 27.7 ± 5.27 years, ranging from 18 to 38 years and 36.4% of the patients were females. In the present study, 38.2% had a family history of hypertension. In addition, 12.7% were underweight, 46.4% had an ideal body mass index, 27.3% were overweight and 13.6% were obese. From personal history obtained from the patients, we observed that 16.4% were regular smokers, while 10% regularly consumed alcohol (Table 1). In the study sample, 20% had a history of anxiety disorders, 15.5% had a past medical history of thyroid disorders, 11.8% had diabetes mellitus and 0.9% had chronic kidney disease. From the history it was found that 12.7% had hypertension for up to one year, 76.4% had hypertension for 2 to 3 years, 7.3% had hypertension for 4 to 5 years and 3.6% had hypertension for more than 5 years. The most common presenting complaint of the patients was headache (65.5%). Other complaints were edema (49.1%), dyspnea (44.5%), palpitations (35.5%), sweating (23.6%), epistaxis (14.5%) and haematuria (10%) (Table 2). It was observed that mean systolic blood pressure was 120.75 ± 15.55 mm Hg, ranging from 110 to 133 mm Hg. Mean diastolic blood pressure was 81.94 ± 14.17 mm Hg, ranging from 70 to 93 mm Hg (Table 3). It was observed that both mean systolic and diastolic blood pressure was lowest in the age group 18 to 25 years and highest in the age group 36 to 40 years (p value < 0.01 for both). Laboratory investigations revealed that mean total cholesterol was 204.88 ± 23.58 mg/dl, ranging from 180 to 271 mg/dl. In addition, mean LDL was 123.58 ± 12.24 mg/dl, ranging from 90 to 158 mm Hg, mean HDL was 41.99 ± 5.81 mg/dl, ranging from 32 to 56 mg/dl and mean triglyceride was 139.51 ± 17.36 mg/dl (Table 4). Based on these findings, 15.5% had high total cholesterol, 13.6% had high LDL, 44.5% had low HDL and 27.3% had high triglyceride (Table 5).

DISCUSSION

Age-related increases in blood pressure were mostly linked to structural changes in the arteries. In addition, a few epidemiological studies found that the prevalence of arterial stiffness and hypertension increased with respondents' age, with the prevalence of hypertension almost tripling in the elderly compared to the young. In the research by Kejrival and Vasoya, the age group with the greatest number of patients (n=17, 34%) was 31-35 years of age, followed by 36-40 years of age (n=13, 26%). Haggart et al. investigated the impact of sociodemographic variables on the management of hypertension in young people with regular access to primary care. The average age of the patients in their study was 33, and 58% of them were male. Beyond visits to primary care clinics, the authors found that sex is an independent predictor of poor hypertension control in adolescents. Young men in their demographic had a higher frequency of severe hypertension than women, which may be a contributing factor. A potential pathophysiologic factor is the higher prevalence of current and former cigarette smoking among young men compared to women; nevertheless, other biological sex differences, such as sex steroid hormone profiles, have been observed. Nearly 70% of the students in another research by Kumar et al. were between the ages of 18 and 19, and over 95% were under the age of 21.

Obesity is known to induce hypertension due to the activation of the sympathetic nervous system, which leads to systemic resistance, which in turn raises insulin resistance and vascular dysfunction. Feng et al. revealed that the distribution of body fat is a major risk factor for obesity-related conditions such as hypertension. Certain clinical practises imply that waist circumference may be substituted for abdominal fat mass and is strongly associated with the risk of cardiometabolic disease.

We discovered that 16.4% of patients were frequent smokers and 10% were habitual alcoholics. According to study by Ghosh et al., smoking does not increase the risk of hypertension. Although it is difficult to

explain why there was no statistically significant correlation between smoking and hypertension, the sample's young is a possible reason. A recent study that examined the life-course effects of smoking on hypertension found that there was no statistically significant association between smoking and the risk of hypertension in those under the age of 35, but that smoking was significantly associated with hypertension in those over the age of 35.

We discovered that 12.7% of individuals had hypertension for less than one year, 76.4% for two to three years, 7.3% for four to five years, and 3.6% for more than five years. No previously published research has recorded the duration of hypertension in young individuals, as far as we are aware.

In the current investigation, headache was the most prevalent presenting symptom (65.5%). Other symptoms included edema (49.1%), dyspnea (44.5%), palpitations (35.5%), sweating (23.6%), epistaxis (14.5%), and bloody urine (10%). Kejrival et al. revealed that 72% (n=36) of patients had headaches, while Chowta et al. discovered that headache was the most commonly reported symptom, accounting for 34% of young and 36% of elderly hypertensives in their investigation. Page also recognised headache as the most often reported hypertension symptom. According to Kjellgren et al., despite the fact that many hypertensives experience symptoms related to their high blood pressure, the bulk of these symptoms are produced by functional somatic syndromes seen in patients who believe they have a serious illness. Kaplan et al. observed that hypertensives who dread their diagnosis and its repercussions are more likely to have symptoms such as headaches and palpitations.

Mean systolic blood pressure was 120.75 ± 15.55 mm Hg, while mean diastolic blood pressure was 81.94 ± 14.17 mm Hg. Kanegae et al. found that DBP has a substantial effect on the development of hypertension in younger patients; thus, it is vital to target DBP reduction in these people. The risk of developing hypertension in compliance with blood pressure was larger in the young population, according to the age-based analysis of this research. According to this study, the risk of hypertension was higher among younger individuals than among older individuals.

CONCLUSION

Based on the results of our study, we conclude that mean age of the patients was 27.7 years and 63.6% were males, headache was the most common symptom. In addition, we found that increasing age, low HDL (44.5%) and low physical activity (60%) were common risk factors among young hypertensive patients in our study. These findings suggest that public health and medical outreach efforts aimed at young individuals, particularly young adult men, may help prevent hypertension and maybe cardiovascular disease in later life.

Table 1. Baseline characteristics of the patients included in the study

Age groups (years)	Frequency	Percent
18 to 25	48	43.6
26 to 30	20	18.2
31 to 35	27	24.5
36 to 40	15	13.6
Gender		
Female	40	36.4
Male	70	63.6
Marital status		
Married	41	37.3
Unmarried	69	62.7
Family history of hypertension		
No	68	61.8
Yes	42	38.2
Body Mass Index category		
Underweight (less than 18.5 kg/m ²)	14	12.7
Ideal (18.5 to 22.9 kg/m ²)	51	46.4
Overweight (23 to 24.9 kg/m ²)	30	27.3
Obese (more than 25 kg/m ²)	15	13.6
Smoking		
Former	21	19.1
Occasional	7	6.4
Regular	18	16.4
No	64	58.2

Alcohol		
Former	11	10
Occasional	17	15.5
Regular	11	10
No	71	64.5
Total	110	100

Table 2. Clinical profile of the patients included in the study

Past medical history	Frequency	Percent
Diabetes mellitus	13	11.8
Anxiety	22	20
Thyroid disorder	17	15.5
Congestive heart failure	2	1.8
Chronic kidney disease	1	0.9
Duration of hypertension (years)		
Up to 1	14	12.7
2 to 3	84	76.4
4 to 5	8	7.3
More than 5	4	3.6
Symptoms		
Headache	72	65.5
Edema	54	49.1
Dyspnea	49	44.5
Palpitations	39	35.5
Sweating	26	23.6
Epistaxis	16	14.5
Hematuria	11	10.0

Table 3. Association of mean systolic and diastolic blood pressures with age groups of the patients

	Age groups	Mean	SD	Minimum	Maximum	p value*
Systolic blood pressure (mm Hg)	18 to 25	117.10	14.72	110	132	< 0.01
	26 to 30	119.45	13.19	110	123	
	31 to 35	123.56	11.78	120	128	
	36 to 40	129.07	12.89	122	133	
	Total	120.75	15.55	110	133	
Diastolic blood pressure (mm Hg)	18 to 25	79.02	12.96	70	89	< 0.01
	26 to 30	80.80	8.89	80	82	
	31 to 35	84.44	12.04	81	89	
	36 to 40	88.27	13.33	80	93	
	Total	81.94	14.17	70	93	
*analyzed using one-way ANOVA test						

Table 4. Description of lipid profile of the patients included in the study

Lipid profile	Minimum	Maximum	Mean	SD
Total cholesterol (mg/dl)	180	271	204.88	23.58
Low density lipoprotein (mg/dl)	90	158	123.58	12.24
High density lipoprotein (mg/dl)	32	56	41.99	5.81
Triglyceride (mg/dl)	110	168	139.51	17.36

Table 5. Dyslipidemia among patients included in the study

Dyslipidemia	Frequency	Percent
High total cholesterol	17	15.5
High low density lipoprotein	15	13.6
Low high density lipoprotein	49	44.5
High triglyceride	30	27.3

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