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Prevalence and Risk Factors of Hypertension in Young Adults and Middle-Aged Individuals: A Cross-Sectional StudyHooriya Fatima^{1#}, Sadia Ahmad^{1,2#}, Naz Fatima^{2,3*}, Husna Ahmad¹, Nadeem Sheikh¹¹Institute of Zoology, University of the Punjab, Quaid-i-Azam Campus, Lahore, 54590, Pakistan.²Department of Zoology, University of Central Punjab, Lahore, Pakistan.³Department of Internal Medicine & Gastroenterology, University of Michigan, Ann Arbor, 48109, USA

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Competing interests

The authors have declared that no competing interests exist.

Abstract

Background: Hypertension has become a prevalent condition among young adults and middle-aged people, driven by genetic and environmental factors.

Materials and Methods: The current study was conducted on young adults and middle-aged individuals from a private sector University of the city. A total of 202 participants were included in the study, with the majority being female of the age range 22 to 24 years.

Results: The findings indicate that 76.4% of the participants had a family history of hypertension, exhibiting early symptoms of high blood pressure. Unhealthy dietary pattern high salt and fat intake by female than male may be attributed to fatigue, and stress, leading to the initial symptoms of the hypertension. However, among males smoking was associated with stress hypertension.

Conclusion: Unhealthy dietary habits, sedentary, lifestyle, smoking are the factors that contributes to the development of early onset of hypertension that may lead to CVD if remains unattended.

Key words: Fast food, High salt intake, Hypertension; Smoking, Young adults

Introduction

Hypertension, commonly known as high blood pressure, can be categorized as primary and secondary hypertension. Primary hypertension is more common in children and young adults, whereas secondary hypertension is prevalent in adults and old people. Hypertension, specifically primary hypertension is becoming more common globally in teenagers and young adults along with obesity. Clinically, hypertension can be of different types such as resistant hypertension, malignant hypertension, isolated systolic hypertension, and white coat hypertension (Hamrahan & Falkner, 2022).

Hypertension is associated with development of chronic kidney disease (Bae et al., 2021) and an increased prevalence of cardiovascular diseases (Luo et al., 2020). Several socio-demographic, lifestyle, health-related, and psychological factors has been found significantly associated with hypertension (Riaz et al., 2021). The prevalence of hypertension is increasing in young people of Generation Z due to unhealthy dietary habits and sedentary lifestyle (Mills et al., 2020). Besides symptomatic hypertension, an increase in silent hypertension has been reported among young individuals otherwise appear normal (Afreen et al., 2019). Lack of awareness about hypertension is a contributory factor to the development of hypertension among people predominantly females in rural areas (Shahbaz et al., 2023). Hypertension is related to cardiovascular diseases (CVD) and its burden is increasing in Pakistan due to a lack of awareness, poor literacy, limited health facilities as well as socio-economic status (Siddique, 2020).

A comprehensive survey was done to study the prevalence of hypertension among students and employees of a private sector Higher Education Institute (HEI) in Lahore, Pakistan. The purpose of this study was to uncover the incidence of hypertension and its correlation with diet, smoking habit, and family history.

Methods

An online questionnaire was developed to gather data related to hypertension, including personal and family history. The questionnaire comprised of 29 questions, including demographic information age, and weight. A pre-informed consent form was also part of the questionnaire. Owing to the non-clinical format of the questionnaire, no approval from the ethical committee was required.

The questionnaire was shared with personal as well as in academic groups of the HEI through email and social media platforms to maximize the responses. The questionnaire was tailored to encompass specific clinical symptomatology of hypertension, as outlined in the World Health Organization (WHO) article last updated on March 16, 2023, (World Health Organization (WHO), 2023). An inclusion, exclusion criteria was applied and participants meeting WHO criteria were included in the study whereas participants with incomplete information, outliers of the age limits, not meeting the WHO criteria were excluded. The methods employed in this survey provided a robust framework for examining hypertension incidence and associated factors among young adults in academic settings. A total of 202 individuals responded to the study questionnaire. The data was analysed using Chi-square

(Fishers Exact test) to compare significant difference among groups and $P \leq 0.05$ was considered statistically significant.

Results

Out of 202 participants, the mean age was 24.58 ± 7.547 with 62.1% being females and 37.4% males. The fatty/junk food consumption among females (40%) was relatively higher than that of males 30% as depicted by the frequency distribution table. In terms of salt intake, males 34% surpassed the females 24%. Similarly, out of 202 individuals, 53% suffered from fatigue, with relatively higher percentage of females (59%) as compared to males (27%). Among females, 64% suffered from stress whereas among males the percentage was 45%. Headache and buzzing, sound in ear, a rare symptom of hypertension, was not very common among both genders, however, 46% of females had relatively faster heart rate as compared to 22% in males, which is significantly correlated with dietary habits having fatty/junk food intake ($P=0.05$). When it comes to sweating 33% makes reported sweating as compared to 26% of females. As smoking is strongly related to hypertension, 20% males were active smokers, with only 1% females. Among the smoker males, 40% were addicted smokers with sweat distress, and 54% were regular smokers.

Table 1: Comparison of Baseline Characteristics of Females and Males to determine Various Risk Factors of Hypertension

Variables		Female (N=126)		Male (N=76)		Chi-Square Value	P value
		%age	n	%age	n		
Salty Food Intake	No	76	96	66	50	2.559	0.07
	Yes	24	30	34	26		
Fatty/Junk Food Intake	No	60	76	70	53	1.823	0.05
	Yes	40	50	30	23		
Fatigue	No	41	52	55	42	3.731	0.03
	Yes	59	74	45	34		
Lifestyle	Active	62	78	80	61	9.158	0.07
	Sedative	30	38	12	9		
	Sedentary	8	10	8	6		
Stress	No	36	45	45	34	1.621	0.13
	Yes	64	81	55	42		
Buzzing	No	82	103	83	63	0.043	0.49
	Yes	18	23	17	13		
Headache	No	68	86	74	56	0.669	0.25
	Yes	32	40	26	20		
Sweating	No	74	93	67	51	1.446	0.19
	Yes	26	33	33	25		
Smoking	No	99	125	80	61	23.516	<0.01
	Yes	1	1	20	15		

Familial hypertension is another factor for development of hypertension among individuals. The data showed that 77% of individuals had a hypertensive family history, along with 33% with cardiovascular disorders (CVD), 18.5% obesity, and 47.3% diabetes in family history.

Family history of hypertension was more prevalent in individuals ranging from 18 to 25 years, having a high intake of fatty/junk food diet, which is an indicator that many of these participants are more prone to become hypertensive due to their familial history and lifestyle. The data further revealed that most of the study participants exhibited one or more symptoms of

hypertension like muscle tremors, chest pain, nausea, and vision changes.

Discussion

The result of this study shows that individuals between the ages of 18 to 25 are at risk of developing hypertension in the future due to unhealthy dietary habits, family history and lifestyle. Furthermore, due to no tendency of routine medical examination, the hypertension symptoms remain undiagnosed in the individuals despite of the fact the symptoms existed. A significant correlation of family history or diabetes with high blood pressure have been reported in China (Li et al., 2021).

Fat and salt intake was found to be associated with fatigue, headache, and stress predominantly in females which is a risk factor for early onset of hypertension. A study has reported that Indonesian population is developing adolescent hypertension. Like our findings, family history, nutritional status, exercise, and stress have been reported as the most common factors contributing to hypertension (Kurnianto et al., 2020). Another research concluded that morning exercise can positively reduce systolic blood pressure, along with abdominal fat and fatigue, specifically in the women population (Arciero et al., 2022).

Similarly, another study among drivers showed that about 11 to 20 cigarettes per day can increase the risk of hypertension along with stress and high fat consumption (Saputri et al., 2020), whereas quitting smoke can help in controlling the onset of hypertension (Nagao et al., 2021).

Conclusion

This study shows that lifestyle has significant impact on developing the hypertension. Unhealthy dietary habits, sedentary lifestyle, smoking are the factors that contributes to the development of early onset of hypertension leading to CVD, which remains ignored for quite some time. Changing the lifestyle, dietary habits, as well as quitting smoke are life changing steps to control hypertension subsequently CVD.

Author contributions

NF conceptualized the study and designed the questionnaire in consultation with NS. HF and SA did data acquisition, data analysis, and prepared the draft manuscript. HA assisted in data analysis, compiling the date, and in manuscript writing. NS and NF revised and approved the final draft of the manuscript. All authors approved the manuscript.

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