Original Article

Incidence of Hypertension in Early Adolescent Children between 12-14 years Old Age

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ABSTRACT

Objective: Prevalence of pre-high blood pressure and hypertension in early adolescent children between 12-14years old age.

Study Design: Cross-section study

Place and Duration of Study: This study was conducted at the schools of intermediate public in Al-Diwaniyah Governorate, Iraq from 1st January 2023 to 15th April 2023.

Methods: This cross-section study was done in schools of intermediate public in Al-Diwaniyah Governorate, Iraq. The participants were carried out on 200 (100 males and 100 females) early adolescent children aged 12-14 years.

Results: There were79% of normal blood pressure values, and 13% of them were in pre hypertension state with 4:5 male to female rate, 2% of them were in hypertension stage 1 with 3:1 male to female rate, 1% were stage 2 all females, 1.5% were isolated systolic hypertension with 1:2 male to female rate, 2% were isolated diastolic hypertension with 1:3 male to female rate, and the remainder were white coat hypertension.

Conclusion: The increasing prevalence of hypertension in childhood were carrying problem of global health, demands early recognition with good treatment, a guide in a specific direction evolve progress with raise awareness of this subject shall be predicted, where early prevention could resolute before all measures.

Key Words: Incidence, Adolescent children, Blood pressure, Hypertension

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INTRODUCTION

One of the major global health issues affecting children and adolescents is hypertension, or increased blood pressure, and this is also true in Sub-Saharan Africa (SSA).[1-4] In SSA, there are currently 26.5 million teenagers with high blood pressure, and this number is projected to rise.[5] This trend is attributed by researchers to increased rates of children and teenage obesity also overweight.[1,2] Comorbidities such as cardiovascular disease and metabolic syndrome are linked to adolescent obesity.[6] Future health outcomes are significantly influenced by adolescence, a critical time in human development.

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The World Health Organization (WHO) defines adolescence as "the period of life between being a child and growing to become adult, extending from the age of 10-19 years.[7]

The leading risk factor for cardiovascular diseases worldwide is hypertension[8], which can damage organs even during adolescence.[9]People who have high blood pressure (BP) as children are more likely to have high BP as adults.[10]

According to a number of guidelines, childhood hypertension should be characterized as increased blood pressure on three different occasions, unlike adult hypertension.[11,12] According to estimates, 4% of children worldwide have hypertension, and between 2000 and 2015, that number increased to 75-79%.[13] The fast economic growth and growing prevalence of childhood obesity in China exacerbate this trend.[14,15] Even while juvenile hypertension symptoms are usually minor, they can cause organ damage[16-18] and lead to early cardiovascular disorders in adulthood.[19-21]

It is unknown how frequently hypertension is detected in pediatric offices in Iraq. Pediatricians in this nation are in charge of the medical treatment of children under the age of twelve. After that, general practitioners (GPs) often take over their treatment, while more than 30% of teenagers between the ages of 13 and 17 still see pediatricians. Our study sought to fill these knowledge gaps by providing a summary of prevalence of hypertensive children in AL-Diwania, Iraq, on bases of three different visits.

METHODS

This cross-section study was done in public schools of intermediate in Al-Diwaniyah Governorate, Iraq from 1st January 2023 to 15th April 2023 vide letter No. 278.A total of 200 (100 males and 100 females) early adolescent children aged (12-14) years were enrolled. A questions form was arranged after dealing with reviewing articles with the prevalence of hypertension as well as pre-hypertension and related outcomes in developed and undeveloped countries and it consisted from knowledge about sex, weight, age, height, and body mass index (BMI), family history of hypertension, blood pressure, and exercise.

The chosen students were contacted following the signing of an informed consent form by the participants and their guardians. A questionnaire was used to gather information on sociodemographic traits such as age in years, parental educational attainment(less than and equal to secondary school), sex, maternal status of employment (employed or housewife), smoker behaviour, and hypertension history in family. To gather the data, the researchers trained two medical research assistants. The usual methods were used to measure height, weight, and blood pressure. Hypertension was regarded as the major objective and BMI and socio-demographics as secondary outcomes after the patient had been seated for at least 10 minutes. the measuring device which was a standardized digital blood pressure (Omron Digital HEM-907,Tokyo-Japan) was used to take the blood pressure twice while the arm was kept at heart level. The average of two blood pressure readings was calculated. If the difference between the two readings was greater than 5 mm Hg, measurements were repeated until the reading stabilized. The diastolic and systolic blood pressures were computed by age as well as sex based on reports made at diagnosis, evaluation, and treatment of hypertension in adolescents and children.

The participants' measurement of weights was in kilograms using the standard methods, which included calibrating the scales and setting them to zero before each measurement. To the nearest 100 grams, the weight was determined. With their hands by their sides and minimal movement, the participants stood. Additionally, shoes and superfluous clothing were removed. The subject's height was measured to the nearest 0.1 cm while they stood erect with their back against the wall and their feet together. The BMI was calculated by dividing the participants' weight in(kg) by their squared height in meters (m). The data was entered and analyzed through SPSS-26.

RESULTS

There were 79% of normal blood pressure values and 13% of them were in pre hypertension state with 4:5 male to female rate, 2% of them were in hypertension stage 1 with 3:1 male to female rate, 1%was stage 2 all females, 1.5% were isolated systolic hypertension with 1:2male to female rate, 2% were isolated diastolic hypertension with 1:3 male to female rate, and the remainder were hypertensive white coat (Table 1). Other findings involving risk factors such as body mass index, exercise, and family history and their relation to every type of hypertension that was found in the sample were implemented (2-4).

Table No. 1: Types of bloodpressure abnormal values according to male and female rates

Gender	Pre-hypertension	Hypertension stage 1	Hypertension stage 2	Isolated systolic HTN	Isolated diastolic HTN	White coat hypertension
Male	12	3	-	1	1	1
Female	15	1	2	2	3	2

Table No. 2: Body mass index of early adolescent childrenarranged dependingonexercise and family history

Variable	Normal BMI	Underweight	Overweight	Obese
Exercise	2	-	-	-
Family history	3	3	3	-
No exercise or family history	13	1	-	-

Table 3: Types of blood pressure abnormal values, categorized based on body mass index values

Variable	Hypertension stage 1	Hypertension stage 2	Isolated systolic HTN	Isolated diastolic HTN
Normal BMI	3	1	3	2
Underweight	-	-	-	-
Overweight	-	-	-	2
Obese	1	1	-	0

Table No.4: Types of blood pressure abnormal values, categorized based onfamily history and exercise

Variable	Hypertension stage 1	Hypertension stage 2	Isolated systolic HTN	Isolated diastolic HTN
Exercise	-	-	1	-
Family history	3	1	1	-
No exercise or family history	1	1	1	4

DISCUSSION

A study from Saudi Arabia that included 401 adolescents (200 males)revealed that Hypertension are present in 69 male and female child (of which are a general prevalence of17.2%) which is higher than its prevalence in our study which is6.5% including hypertension stage one 2%, hypertension stage two 1%,isolated systolic hypertension 1.5% and isolated diastolic hypertension 2%.In their sample, 17 children (4.2%) had pre-hypertension with a ratio of male to female was 2.1:1, however in our sample, the percentage was significantly higher (13% of our sample had pre-hypertension with ratio of male to female reported as 0.8:1). With a ratio of male to female reported 1.5:1 in their sample and 0.8:1 in ours, obesity was observed in 77 young children (19.2%) as opposed to just 9 in our sample (4.5%). While 33 children (8.2%) were underweighting in the Saudi study and 15% in ours, 60 patients (15%) in the Saudi study were overweight, which is quite similar to their prevalence in our study (14%).[3]

The prevalence of hypertension among school-age teenagers was found to be 5.62% in an Indian study conducted in 2009 till 2010, which is less than the 6.5% seen in our study.[4] According to a different Pakistani research, 3% of people had hypertension. Studies conducted in the West likewise found that 2–5% of people had hypertension.[5,6]

A research conducted in Switzerland in 2005 to 2006 looked at 5207 students in the canton of Vaud's sixth grade (2621 boys, 2586 girls).[10] The prevalence of excess body weight (also known as "overweight" or "at the risk of becoming overweight") was reported 14.3%, which is almost identical to the 14% found in our study.(7) Compared to our study, which found 2% stage 1 and 1% stage 2 (8.9), the prevalence of hypertension was 2.2% in this study (1.7% stage 1 and 0.4% stage 2). We recommend doing other studies to early detect undiagnosed cases. Prevention of hypertension may be considered as part of the prevention process for stroke as well as disease of cardiovascular system. Public health, population-based measurements to the reduction of primary hyper-tension in children as well as adults include reduced sodium intake, reduction in obesity, and an increase in physical activity through school- and community-based programs and avoidance of tobacco intake.

CONCLUSION

The increasing prevalence of hypertension in childhood were carrying problem of global health, demands early recognition with good treatment, BMI and no exercise are significantly correlated with hypertension. Initiatives aimed at preserving a healthy body mass index during adolescence are advised in order to support teenagers' well-being both now and in the future. The sustainability of such projects depends on the participation of all relevant parties.

Author's Contribution:

Concept & Design or acquisition of analysis or interpretation of data:	Qahtan Khayoon Alyasiri, Suzan Sabbar Mutlag
Drafting or Revising Critically:	Qahtan Khayoon Alyasiri, Hind Muter Ibrahim
Final Approval of version:	All the above authors
Agreement to accountable for all aspects of work:	All the above authors

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