

PREVALENCE OF HYPERTENSION AMONG URBAN SCHOOL CHILDREN – A CROSS SECTIONAL STUDY

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Abstract

Background

In India, a rapid epidemiological transition is occurring as the burden of non communicable chronic diseases is over taking the burden of infectious diseases. Early diagnosis of hypertension (HT) is an important strategy in controlling the disease among younger generations. Many recent studies have highlighted the incidence of hypertension in young children and adolescents. The objective of the present study is to assess the prevalence and determinants influencing hypertension in urban school children in Bettiah, Bihar.

Methods:

This is a school based cross sectional study, done to estimate the prevalence of hypertension among healthy school children in urban Bettiah. Children between the age of 12-17yrs were included in this study. Demographic data, academic performance as well as dietary pattern were assessed. Students were selected based on purposive sampling method and blood pressure measurements were recorded using a mercurial sphygmomanometer as per WHO criteria. Data collected were analysed using SPSS software. Demographic variables are presented in frequencies. Semi parametric statistical test -Chi-square test was used to find out the association of various risk factors that influenced hypertension among the school children.

Results:

Prevalence of hypertension was 2.4% and pre hypertension was 4.2% among the urban school children. Family history of hypertension, increased waist-hip ratio, obesity and excessive consumption of fast food are being reported as a major risk factor in the development of childhood hypertension from this study.

Keywords: Hypertension, School children, Risk factors

Introduction

Hypertension is considered as one of the major non-communicable disease which is associated with significant cardiovascular morbidity and mortality in India and throughout the world. Plethora of researches suggest that the prevalence of hypertension is rapidly increasing in many developing countries like India. It is theorized that the prevalence of slow epidemics like are likely to cast a shadow over infectious diseases in the forthcoming years. Systemic hypertension (HTN) and the morbidities associated with it is are fast becoming a prominent cause of death worldwide. Mortality secondary to systemic HTN is estimated to be 7.5 million which constitutes about 12.8% of all deaths, worldwide. Data pertaining to childhood hypertension among school going children is very scanty in Indian scenario.^[1] The prevalence of hypertension occurring in childhood varies from 1% to 16.2% and seems to be towering.^[2] With global proliferation and changes in lifestyle across the globe, children and adolescents are exposed to multiple risk factors, including improper diet, academic stress, lack of physical activity and lack of sleep apart from hereditary risk factors. The cumulative impact of these risk factors have influenced the children towards developing HTN.^[3] During routine medical examination, measurement of BP is often neglected in children however periodic BP monitoring and prompt diagnosis of HTN is an essential strategy to prevent and control HTN and associated complications in children^[4]. Consequently, from the recommendation of the fourth report from the National high BP education program working group, it is important to measure BP during routine physical examination of all children above 3 years of age.^[5] Primary or essential HTN is more persistent in adolescents and is associated with numerous risk factors, including obesity and family history of HTN. Secondary HTN is consistent among pre-adolescent children, most commonly due to renal etiology. Given the decisive role of childhood hypertension and pre-hypertension leading to adult cardiovascular morbidities and to the fact that exposure to the

major risk factors begins in childhood, pediatric health care providers should be encouraged to include BP monitoring during formal health assessment particularly in children^[6] The present study was planned to assess the prevalence of hypertension in school children based on JNC-7 criteria and to analyze the major determinants of hypertension particularly in Indian scenario.

Methodology

A cross sectional study was planned to determine the prevalence of HT and its determinants among private urban school going children in Bettiah. Purposive sampling method was employed for selecting the children according to the inclusion criteria.

Data Collection

Questionnaires and forms seeking informed consent were sent to the parents to obtain data regarding the child's age, gender, and health conditions, family history of HTN. The questionnaire contained questions about their socio economic status, prevalence of conditions such as diabetes, or heart disease among blood-related family members. The child was considered to have a positive family history only if some pre-existing disease was present in a first-degree relative.

Measurements

Height, weight and blood pressure of the children were measured using standard procedures. Body weight was measured in kilogram on a calibrated digital scale. Height was measured in centimeters.

Body mass index (BMI) was calculated based on body weight in kilograms divided by the square of height in meters (kg/m^2), was used as an estimate to assess obesity. Children's BMI were classified according to the Centers for Disease Control and Prevention (CDC) age- and sex-specific growth charts^[7].

Three blood pressure measurements were recorded using a mercurial sphygmomanometer at an interval of 5 minutes and the mean was taken for analysis (JNC criteria). The blood pressure measurements were compared with variables like age, sex and BMI. Ethical clearance was obtained from institutional ethical committee. An informed consent for conducting the study was obtained from the children's parent or heads of the Institutions. The Data was tabulated in MS-Excel and statistical analysis was performed using SPSS software version 20. Descriptive statistics were employed for gender, BMI, family history and BP

categories. Chi-square test was done to ascertain the association between various variables that influenced hypertension.

Results

This study included 450 school going children in the age group of 12–17 years. The number of female children were 300(66.6%) and male children were 150 (33.4%).Among the total children, 270 (60%) had normal weight and 135(30%) were overweight and 45(10%)were obese. Overall prevalence of hypertension among the private school students were 2.75% and pre- hypertension was 4.75%. Prevalence of hypertension and pre hypertension among obese children were found to be 6 (54%) and 15(78%) respectively. Weight and increased BMI were found to have a highly significant association with HTN (p-value 0.001). Prevalence of HTN was more in girls (73%) when compared to boys (and also the prevalence of pre-HTN were also high among the girls (80%) when compared to boys(20%)(P value= 0.026). There was statistically significant association between age and pre-HTN (p-value 0.023). However, there was no significant association between age and HTN (p-value 0.210)according to this study. Waist-hip ratio was high among hypertensive children and had a statistical significant association (p-value 0.013). HTN was high among those who ate frequent non-vegetarian,junk food and had less physical activity and had a significant association (p value-0.022). There was high statistical significant association found between socioeconomic status, academic performance,educational level of parents, occupation, income with prevalence of HTN among school children (P=0.001).

Figure-1: HTN among urban school Children

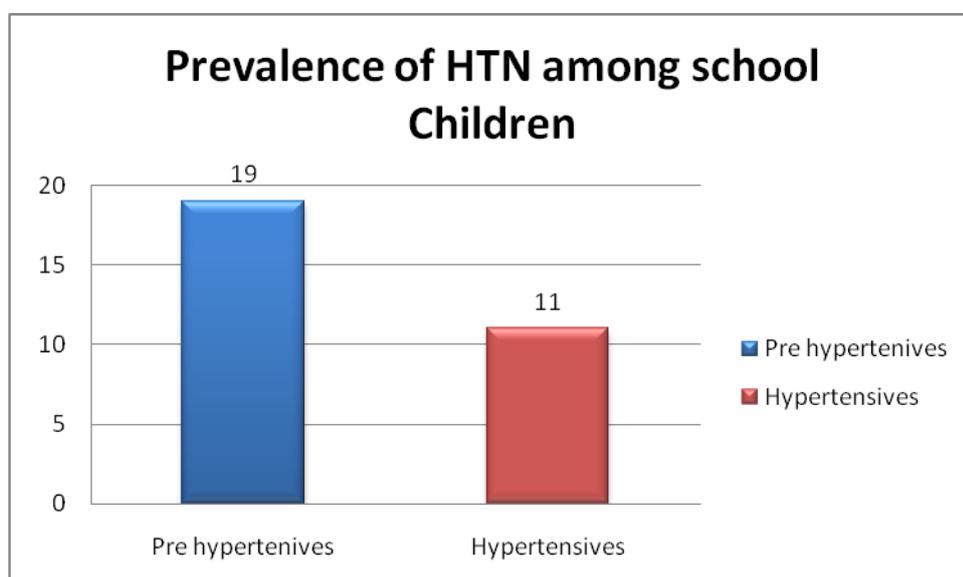
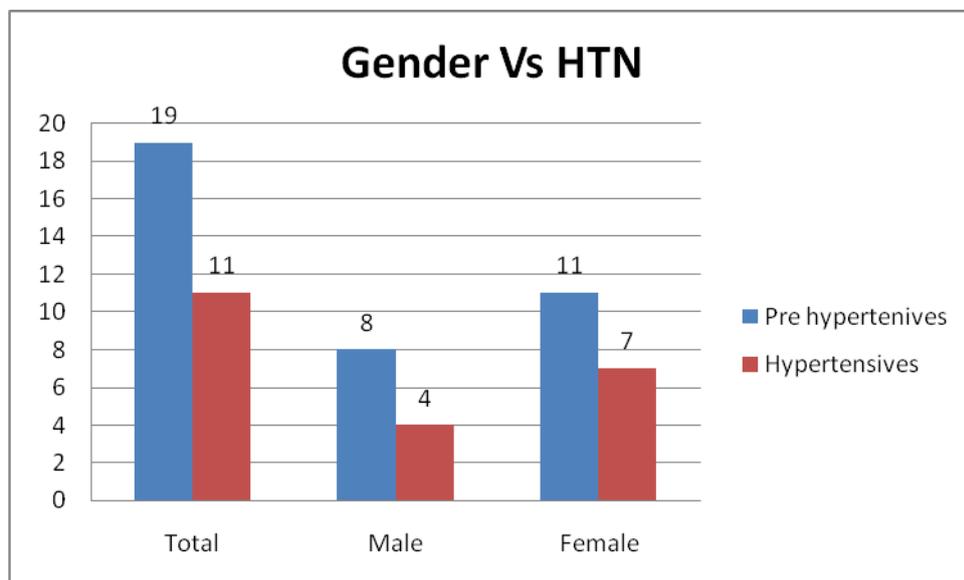


Fig-2 Gender Vs HTN among school children



Discussion

This study reported the burden and contributing factors of pre-HTN and HTN in school going children of urban Bettiah. The prevalence of hypertension reported among the study population was 2.75% and were associated with several factors including obesity, family history, academic performance, socio-economic status and indirect factors like education and occupation of parents. Similarly prevalence of pre-HTN was 4.75% (4.9%) similar to studies done by Salman et al. among school children in Sudan^[8] however a higher prevalence of HT (5.9%) and pre-HT (12.3%) was observed by Sharma et al. in school going children of Shimla, India. This may be attributed to the fact that HT and pre HT varies from one community to another.^[9] In this study, HTN was associated with increasing age and the study findings were concurrent with many studies which also found that the level of blood pressure increased with age, and this was more pronounced in urban areas^[10]. The most important determinants of pre-HTN and HTN in this survey were WHR, obesity, and fast food intake. This epidemiological transition of HTN is attributed to nutritional evolution brought about by changes in lifestyle and dietary habits. Thus, physical inactivity, excessive intake of salt refined sugar, and polysaturated fats increase the risk of obesity or overweight which is a determinant of increased cardiovascular risk among children^[11]. In this study, HTN was

found in 2.75% of children and this is continuously increasing in developing countries like India where the prevalence appears to be more constant.

Conclusion

Both prevalence of pre-HTN and HTN are recognized as a public health problem in schoolchildren. The trend of hypertension prevalence among asymptomatic children seem to increase over the years and greater care should be employed in prevention and control of non communicable diseases like HTN among children which may pose a serious cardiac threat. The major risk factors identified by this study are obesity, less physical activity, increased WHR and dietary pattern.

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Conflicts of Interest: None

Ethics committee approval: This study was duly approved by the ethics committee of Government Medical College, Bettiah, Bihar.

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