



ORIGINAL RESEARCH PAPER

Physiology

CLINICAL ASSESSMENT OF PRIMARY AND SECONDARY HYPERTENSION IN CHILDREN AND ADOLESCENTS IN TRIBAL AREA OF GUJARAT

KEY WORDS: Systemic HTN, adolescents, children.

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ABSTRACT

The aim of this study was to compare the clinical features of patients with elevated blood pressure and to detect variables associated with the diagnosis of primary hypertension. We identified 383 (69%) hypertensive children (197)[51.5%] with primary hypertension, and 186 [48.5%] with secondary hypertension) out of 553 children referred to our clinic with a history of elevated blood pressure. The primary hypertension group was significantly older and had higher BMI, positive family history of hypertension, and lower prevalence of preterm birth compared with those with secondary hypertension. No difference was found between the two groups in terms of the frequency of target organ damage. Multiple regression analysis showed that a family history of hypertension, obesity, age over 10 years, elevated uric acid, and presence of higher systolic blood pressure values at admission were independent predictors of primary hypertension; therefore, these parameters can be considered important clues for diagnosing primary hypertension.

INTRODUCTION

Systemic hypertension (HT) is a major cause of morbidity and mortality in the general population. It is generally considered as a disease of adulthood, with a prevalence of 40%. Although HT in children is less common than in adults, there is growing concern about elevated blood pressure (BP) and HT in children and adolescents because of the obesity epidemic. Moreover, it has been hypothesized that adult HT has its roots in childhood. Genetic and environmental factors are considered to be predictive of subsequent HT in adults. Children with high BP values have a greater risk to have high BP levels in adulthood, supported by the fact that almost half of adults with HT had high BP values in childhood. Therefore, prevention of adult cardiovascular diseases should begin early in childhood by early recognition of HT and choosing a healthy lifestyle. Historically, the most prevalent form of HT in childhood was secondary HT, but this has changed recently. Primary HT is now becoming the dominant cause of HT in children older than 6 years of age, and its prevalence is almost the same as that of secondary HT. A multicenter study showed that 43% of children with elevated BP were diagnosed as having primary HT and, furthermore, after age 6 years, essential HT was the predominant etiology for HT. Primary HT is the most frequent type of HT in adults (95%) and is diagnosed when there is sustained elevation of BP greater than 140/90 mm Hg with no underlying etiology. However, the diagnosis of HT in children is more complicated than in adults. The BP norms during childhood are influenced by the height, age, and sex of the child; hence, a single threshold similar to that for adults does not exist. It is thought that many different combinations of factors play a role in the etiology and pathophysiology of primary HT. Obesity, insulin resistance, activation of the sympathetic nervous system, sodium homeostasis, the renin-angiotensin system, vascular smooth muscle structure and reactivity, serum uric acid levels, genetic factors, and fetal programming have all been implicated in primary HT. Some clinical and laboratory clues may help in the diagnosis of primary HT, but they are unable to help doctors go beyond a suspicion.

On the other hand, it is very important to distinguish primary versus secondary HT so as to avoid extensive investigation of the etiology of HT in children with primary HT, yet without missing the detection of secondary HT. The purpose of this study was to evaluate etiological factors leading to HT and to determine the percentage of primary and secondary forms among children diagnosed with HT at a tertiary center. We aimed to compare the clinical features of primary and secondary HT and to determine clinical variables associated

with primary HT that might help in the differentiation between primary and secondary HT.

MATERIAL AND METHODS

This was a retrospective study of patients who were found to have high BP at a general pediatric clinic and then referred to the pediatric nephrology clinic. Children between the ages of 5 and 19 years with a height of ≥ 120 cm (due to the absence of ambulatory blood pressure monitoring [ABPM] reference tables for children) were included.

DISCUSSION

This retrospective study was conducted with 553 otherwise healthy children aged 5–19 years with elevated BP referred to pediatric nephrology, among whom 69.2% were diagnosed with HT of whom 51.5% had primary HT. Primary HT is currently the predominant diagnosis among hypertensive children and adolescents. However, its exact prevalence is still unknown. Authors of a large study reported that one half of patients had primary HT, seen in 17% of young, 62% of ADOLESCENTS. However, the diagnosis of HT in children is more complicated than in adults. The BP norms during childhood are influenced by the height, age, and sex of the child; hence, a single threshold similar to that for adults does not exist. It is thought that many different combinations of factors play a role in the etiology and pathophysiology of primary HT. Obesity, insulin resistance, activation of the sympathetic nervous system, sodium homeostasis, the renin-angiotensin system, vascular smooth muscle structure and reactivity, serum uric acid levels, genetic factors, and fetal programming have all been implicated in primary HT. Some clinical and laboratory clues may help in the diagnosis of primary HT, but they are unable to help doctors go beyond a suspicion. On the other hand, it is very important to distinguish primary versus secondary HT so as to avoid extensive investigation of the etiology of HT in children with primary HT, yet without missing the detection of secondary HT.

RESULTS

A total of 553 patients with history of elevated BP were included in the analysis. Among these patients, 69.2% were diagnosed with HT (58.5% boys, mean age 13.4 ± 3.3 years) of whom 48.5% had a secondary cause for their HT (secondary HT) and 51.5% had no known cause identified (primary HT). The remainder of the patients had normotension (12.1%), white coat hypertension (7.2%), prehypertension (6.5%), and those with a diagnosis that was pending (4.8%) who were lost to follow-up with an incomplete.

CONCLUSION

Our study aimed to define clinical features and laboratory parameters at admission suggestive of primary HT. The severity of BP differed significantly between children with primary and secondary HT. Diastolic BP and night time BP elevation appeared to be more predictive of secondary HT, whereas 24-h systolic BP was predictive of primary HT. We speculate that children older than 10 years of age do not need to be evaluated with further investigations for secondary causes if they have a family.

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