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Hypertension in children and adolescents – Part I: a renewed challenge

This article summarizes important issues related to the diagnosis and management of hypertension in children and adolescents.

Hypertension is a major risk factor for coronary artery disease (CAD) in adults. Of importance, atherosclerotic changes may also be present in young adults, and these may be associated with a history of systemic hypertension in childhood or adolescence.¹ Similarly, a sizeable proportion of hypertensive adults have a history of childhood hypertension.² The relationship between obesity, the metabolic syndrome, and hypertension is of major importance—particularly in relation to the current obesity epidemics—as obesity is likely to be a strong risk factor for childhood hypertension.^{3,4}

Detecting hypertension in children

Clear guidelines exist in relation to the identification and treatment of childhood hypertension, and cardiologists in particular and physicians in general should seize every opportunity to detect the presence of hypertension in children and adolescents.⁴ Current recommendations, based on clinical research data, usual practice, and expert opinion, indicate that blood pressure should be checked routinely at every visit in children 3 years of age and older.⁵ In order to establish a reliable diagnosis, three separate readings of an elevated blood pressure (blood pressure level higher than 90th percentile for age, height, and gender) on separate visits are necessary. Blood pressure in children should be measured after 5 min rest in the sitting position and using a cuff that is appropriate to the size of the child's upper right arm (the preferred arm for assessment of blood pressure in children), as the use of an oversized or an undersized cuff can lead to erroneous blood pressure measurements.^{4,5}

Searching for possible causes of hypertension and risk factors

Childhood hypertension, particularly in preadolescents, is often due to an underlying disorder. Renal parenchymal disease is the most common cause of secondary hypertension in children.⁶ In adolescents, however, essential hypertension is the most common cause of high blood pressure. High blood pressure is often associated with risk factors such as obesity and a family history of hypertension. Currently, hypertension in adolescents is often found in association with the metabolic syndrome, which is present in up to 8% of individuals in some series.⁷ Obesity increases the occurrence of hypertension, and favors the development of

insulin resistance, dyslipidemia, and salt sensitivity.^{4,7} Studies have shown that essential hypertension in adolescents is associated with insulin resistance, lower folate plasma levels, and increased homocysteine concentrations.⁸

Management

General measures. In cases of secondary hypertension—a common occurrence in hypertensive children—management should be directed at the cause of the elevated blood pressure.^{4,5} In order to establish the right treatment strategy, physicians should assess the existence of: end-organ damage, risk factors, and comorbidities.⁵ As in adults, lifestyle modification should be the first line of therapy in hypertensive children and adolescents with essential hypertension.⁴ Exercise, a low-fat and low-salt diet (<1.2 g per day), weight reduction, and a complete ban on cigarette smoking and alcohol consumption are of paramount importance. Ensuring a high intake of potassium appears to be a useful complementary measure for blood pressure reduction.⁹

Drug therapy. It is recommended that antihypertensive agents be used in children and adolescents with symptomatic hypertension and/or end-organ damage, ie, retinopathy, proteinuria, and cardiac hypertrophy.⁵ The therapeutic goal in this specific age group is to reduce blood pressure to less than the 95th percentile for age, height, and gender. If end-organ damage is present, a more demanding goal has been established, ie, greater than the 90th percentile. It has to be remembered that pharmacological treatment should be viewed as a complementary measure to lifestyle changes and risk factor management.⁵

Conclusions

Hypertension in children and adolescents is a growing problem in the developed world that appears to go hand in hand with obesity, the metabolic syndrome, and diabetes. Strategic planning and opportunistic blood pressure checks are important to detect subjects with prehypertension or established hypertension. Guidelines exist at present that provide effective advice on diagnosis and management of hypertension in children and adolescents.

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