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## Hypertension in children and adolescents – Part II: the risks of ignoring the problem

The importance of a timely diagnosis of hypertension in children and adolescents was highlighted in a previous issue of the *ECJBF* Vol XIV n° 12. The present article deals with the consequences of not paying sufficient attention to the important problem of hypertension and associated cardiovascular risk factors in children and young adults.

Systemic hypertension in adolescence is highly prevalent in the Western world, and the problem is growing fast, in association with the increased incidence of diabetes and obesity.<sup>1,3</sup> Indeed, studies have shown that essential hypertension in children and adolescents is more common in subjects with excess weight.<sup>1-3</sup> It is important to remember that hypertension during adolescence and childhood is an independent risk factor for hypertension and the development of atherosclerotic heart disease in adulthood.<sup>4,7</sup> As discussed in a previous article in the *European Cardiologist – Journal by Fax*, there are technical and logistic difficulties with measurements of blood pressure in younger children. The issue is further complicated by the fact that normal and abnormal blood pressure values vary with age, gender, and height, and physicians find it difficult to remember these values.<sup>8</sup> Perhaps for these reasons, and others, hypertension is, unfortunately, often undiagnosed in children and adolescents.

In a very interesting study, Hansen et al<sup>8</sup> recently assessed the frequency of undiagnosed hypertension and prehypertension in children and adolescents, and attempted to identify the reasons for this “underdiagnosis”. They recruited 14 187 children and adolescents aged 3 to 18 years who attended, at least 3 times, well-child care outpatient clinics in a large academic urban medical system in Ohio. The main outcome measures were to identify: (i) The proportion of children and adolescents with 3 or more elevated, age-adjusted and height-adjusted, blood pressure measurements; and (ii), the number of subjects with a documented diagnosis of hypertension or prehypertension.

The authors observed that of 507 children and adolescents (3.6%) found to be hypertensive in the study, 131 (26%) had a correct diagnosis of hypertension documented in the electronic medical record. They report that “patient factors that increased the adjusted odds of a correct diagnosis were a 1-year increase in age over age 3 (odds ratio [OR], 1.09; 95% confidence interval [CI], 1.03-1.16), number of elevated blood pressure readings beyond 3 (OR, 1.77; 95% CI, 1.21-2.57), increase of 1% in height-for-age percentile (OR, 1.02; 95% CI, 1.01- 1.03), having an obesity-related diagnosis (OR, 2.61; 95% CI,

1.49-4.55), and number of blood pressure readings in the stage 2 hypertension range (OR, 1.68; 95% CI, 1.29- 2.19).”

Regarding prehypertension, of 485 children and adolescents (3.4%) who were found to have prehypertension in the study, only 55 (11%) had an appropriate diagnosis documented in the medical record. Again, as for hypertension, patient factors that increased the adjusted odds of being diagnosed with prehypertension included: “ a 1-year increase in age over age 3 (OR, 1.21; 95% CI, 1.09-1.34) and number of elevated blood pressure readings beyond 3 (OR, 3.07; 95% CI, 2.20-4.28)”.

The study thus clearly showed that both hypertension and prehypertension are often undiagnosed in a children and adolescents. Also of interest is the fact that the prevalence of hypertension in the Hansen study<sup>8</sup> is similar to that in other studies.<sup>1,2</sup> The reasons, however, for hypertension and prehypertension to have been missed by the pediatricians during the conventional visits are speculative.

Was it lack of knowledge of the normal blood pressure ranges and/or lack of awareness of the patient’s previous blood pressure readings? As mentioned before, normal values of blood pressure in children are not easy to remember as they vary with gender, age, height, etc. Tables do exist with normal values, and it may be useful to have them at hand when assessing hypertension in this patient group.<sup>9</sup> Although time-consuming—a major problem in busy health centers—tools that allow a better diagnosis of hypertension need to be used systematically. Similarly, guidelines for management are available which represent sound advice regarding effective strategies for blood pressure reduction in children.<sup>9</sup>

**The benefits of accurately diagnosing and managing prehypertension or hypertension in younger patients are substantial regarding prevention of both end-organ damage and the development of cardiovascular disease and its complications at an early age. This notion should perhaps represent a stimulus to increase awareness among health professionals dealing with this important issue.**

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