



# Revista Portuguesa de Cardiologia

Portuguese Journal of *Cardiology*

[www.revportcardiol.org](http://www.revportcardiol.org)



## EDITORIAL COMMENT

# Pediatric hypertension: Cardiovascular prevention must begin early in life



## Hipertensão pediátrica: a prevenção cardiovascular tem de começar cedo

Roberto Palma Reis

*Serviço de Cardiologia, Hospital Pulido Valente, Lisboa, Portugal*

Hypertension is a major cardiovascular risk factor that affects all countries and regions in the world. It is more prevalent when countries industrialize and populations move from the countryside to cities, adopting lifestyles that include higher salt and calorie intake and less exercise.

In these circumstances, hypertension, together with other risk factors such as obesity, diabetes and hypercholesterolemia, as well as smoking, is associated with the new epidemic of cardiovascular disease, which is typical of the epidemiological transition from the 'age of pestilence and famine' to the 'age of degenerative and man-made diseases'.

It is accepted that hypertension causes premature vascular degeneration, doubling the risk of cardiovascular disease, including stroke (ischemic or hemorrhagic), coronary artery disease, heart failure and renal failure.

Hypertension can be easily diagnosed by direct measurement, but even today, it is often under-detected, untreated or under-treated, and therefore the most common, readily identifiable, reversible risk factor for vascular disease in all territories remains a major unresolved public health problem.

Since hypertension leads to vascular degeneration, it is important to diagnose it as early in life as possible, and

at the same time, to understand and control the factors associated with the development of this ubiquitous disease.

In the current issue of the *Journal*, Reuter et al. present a paper on hypertension in schoolchildren, assessing the sociodemographic and biochemical factors associated with this disease.<sup>1</sup>

In their study, which included a sample of 1201 children and adolescents aged from seven to 17 years attending Brazilian schools, the prevalence of biochemical cardiovascular risk factors was high: 61% of the schoolchildren presented hypercholesterolemia, 44% high low-density lipoprotein cholesterol levels, 22% hypertriglyceridemia, 16% low high-density lipoprotein cholesterol levels and 17% dysglycemia (pre-diabetes or diabetes). As well as all these metabolic risk factors, the prevalence of hypertension was 16.2%.

The prevalence of hypertension found by Reuter et al. in schoolchildren (16.2%) is high, but lower than the 26.6% found by Fraporti et al. in children between six and nine years of age in Brazil.<sup>2</sup> It is not very different from the results of several Portuguese studies, in which prevalence ranges from 12.8% in those aged from four to 18 years<sup>3</sup> to 34% in 15-17-year-old adolescents<sup>4</sup> and, in the middle, 24.9% in a population of university students with a mean age of 21 years.<sup>5</sup>

All these different prevalences of hypertension in various populations of young individuals should be treated with caution, because hypertension in children is not as clearly defined as it is in adults. In the latter, there is a universally accepted universal cutoff (140/90 mmHg). In children,

DOI of original article: <https://doi.org/10.1016/j.repc.2018.06.009>

E-mail address: [palma.reis@nms.unl.pt](mailto:palma.reis@nms.unl.pt)

hypertension is defined as blood pressure (BP) above the 95th percentile in that age group. Given this definition, the distribution of BP in the relevant age group needs to be known in order to determine who is hypertensive.

Whatever the study parameters, one thing is clear: hypertension in children and adolescents is a public health problem, with a prevalence considerably in excess of 10%, both in Portugal and in Brazil.

Not surprisingly, in Reuter et al. as well as in various other studies, hypertension is associated with increasing age and with other metabolic abnormalities. Hypertension should therefore be considered part but not all of the problem.

The present paper has the merit of presenting the high prevalence of hypertension and the even higher prevalence of biochemical cardiovascular risk factors in this population of Brazilian schoolchildren.

Overall, this metabolic pattern clearly demonstrates a problem of lifestyle: these children do not eat or exercise appropriately. It is important to recognize that this risk factor pattern represents a clear mismatch between high sodium and calorie intakes and the low metabolic needs associated with a sedentary lifestyle.

Surprisingly, Reuter et al. found a positive association between hypertension and attending schools in the state educational network. This highlights the need to include health education in official programs at all educational levels, and particularly in state institutions. If taught appropriately, schoolchildren can and should be health ambassadors, adopting and promoting healthy lifestyles in their families and communities.

Concerning exercise, physical education should be made a compulsory part of the school curriculum, with evaluation and classification of results, as with other disciplines. Inclusive team sports such as soccer and basketball should also be encouraged.

With regard to food intake, healthier diets should be introduced in school canteens, with less salt, sugar, fat and fried foods, and promoting a balanced diet including fruit and vegetables.

In view of the above, it is clear that hypertension and other cardiovascular risk factors represent real problems and a real threat from young ages onward.

As part of a strategy of population health management, schoolchildren and their families should be included as early

as possible in public health educational programs to promote healthy lifestyles and to decrease cardiovascular risk. These programs should be aimed at the entire community, irrespective of age and cardiovascular risk. It is not necessary to assess cardiovascular risk in order to promote healthy lifestyles, encourage smoking cessation, and foster the adoption of appropriate diet and exercise.

At the same time, given the high prevalence of risk factors in young people, any opportunity should be taken to assess their cardiovascular risk factors, particularly BP. Those at high risk (with individual or clustered cardiovascular risk factors) should be moved from the populational level of care to a higher-risk level, as they warrant more intensive intervention, if necessary including the use of medication.

Adopting such an active and aggressive approach to cardiovascular risk factors, beginning at young ages, will make it possible to reduce and delay the onset of cardiovascular disease, aiming to evolve from the age of degenerative diseases to the fourth stage of the epidemiological transition, the age of delayed degenerative diseases.

## Conflicts of interest

The author has no conflicts of interest to declare.

## References

1. Reuter CP, Rodrigues ST, Barbien CD, et al. High blood pressure in schoolchildren: associated sociodemographic and biochemical factors. *Rev Port Card.* 2019;38:191–7.
2. Fraport MI, Adami FS, Roselen MD. Cardiovascular risk factors in children. *Rev Port Card.* 2017;36:6099–705.
3. Maldonado J, Pereira T, Fernandes R, et al. An approach of hypertension prevalence in a sample of 5381 Portuguese children and adolescents. The AVELEIRA registry ‘‘Hypertension in children’’. *Blood Pressure.* 2011;20:153–7.
4. Silva D, Matos A, Magalhães, et al. Prevalência de hipertensão arterial em adolescentes portugueses da cidade de Lisboa. *Rev Port Card.* 2012;31:789–94.
5. Dores H, Santos P, Salvador F, et al. Blood pressure in young adults. *Rev Port Card.* 2010;29:1495–508.