

Cardiovascular risk profile in children and adolescents in a Portuguese school

Maria Carolina Baptista Duarte¹, Patrícia Coelho², Francisco Rodrigues³, Ema Nair Torres Militão Cabral⁴.

ABSTRACT

Introduction: Arterial hypertension (HTA) is one of the most important risk factors for the development of cerebrocardiovascular diseases and is one of the main causes of mortality and morbidity in Portugal.

Objective: To evaluate the prevalence of high blood pressure and lipid profile in children and adolescents in students of the 2nd and 3rd cycle and secondary education of a school group in Portugal. **Methodology:**

The sample was collected in a group of schools in the interior of Portugal, from students attending from the 5th grade to the 12th grade of schooling. The sample consists of a total of 156 students, aged between 10 and 18 years. It was proposed to fill out a questionnaire and the blood pressure was measured in each individual and the lipid profile was evaluated in everyone. The collection and analytical processing of the data for the realization of this study required the submission and request for authorization to the Ethics Committee of the Polytechnic Institute of Castelo Branco, followed by the authorization of the direction of the school grouping. **Results:** The prevalence of high blood pressure was 38.8% and higher in males. A higher prevalence of hypertension and high triglyceride levels was observed in students who did not exercise outside school and in individuals who ate higher amounts of meat, who also had a higher prevalence of higher than expected levels of high-density lipoprotein (HDL) cholesterol. **Discussion and Conclusion:** In this study, a high percentage of hypertension and alterations in the lipid profile was observed among secondary school students of this school in the interior of Portugal, as has been observed in other studies. It was concluded that it is essential to carry out more studies, screenings and investigations that identify these cases early, to mitigate the cerebrocardiovascular risks.

Keywords: Hypertension, Children, Blood pressure, Risk factors, Adolescents.

¹ Polytechnic Institute of Castelo Branco – Portugal

² Sport Physical Activity and health Research&innovation Center (Sprint) Polytechnic Institute of Castelo Branco – Portugal

³ Sport Physical Activity and health Research&innovation Center (Sprint) Polytechnic Institute of Castelo Branco – Portugal

⁴ Polytechnic Institute of Castelo Branco – Portugal



REFERENCES

- BELL, C. S.; SAMUEL, J. P.; SAMUELS, J. A. Prevalence of Hypertension in Children. *Hypertension*, 73(1), 148–152, Jan. 2019a.
- CABRAL, E.; COELHO, P.; BARBAS, F. Estudo da pressão arterial e do perfil lipídico em crianças e adolescentes. ANAIS I Seven International Medical and Nursing Congress, 2022.
- CARDOSO, J. L.; LEONE, C. Growth achieved and correlation with blood pressure levels in schoolchildren. *Revista da Associação Médica Brasileira*, 64(10), 896–901, Oct. 2018.
- CUNHA, E. DEL B. B. et al. Evaluation of Lipid Profile in Adolescents. *International Journal of Cardiovascular Sciences*, 2018.
- DIRECÇÃO-GERAL DA SAÚDE, R. J.; RITO, A.; BREDA, J. Catalogação na Fonte: PORTUGAL. Ministério da Saúde. Instituto Nacional de Saúde Doutor Ricardo Jorge e outro Guia de avaliação do estado nutricional infantil e juvenil / Instituto Nacional de Saúde Doutor Guia de Avaliação do Estado Nutricional Infantil e Juvenil. 2011.
- Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents: Summary Report. *Pediatrics*, 128(Supplement_5), S213–S256, Dec. 2011.
- FAN, Z. et al. Differences in prevalence of prehypertension and hypertension in children and adolescents in the eastern, central and western regions of China from 1991-2011 and the associated risk factors. *PLOS ONE*, 14(1), e0210591, 10 Jan. 2019.
- REFERENCE, B. A. et al. Low-density lipoproteins cause atherosclerotic cardiovascular disease. 1. Evidence from genetic, epidemiologic, and clinical studies. A consensus statement from the European Atherosclerosis Society Consensus Panel. *European Heart Journal*, 38(32), 2459–2472, 21 Aug. 2017.
- FRAPORTI, M. I.; SCHERER ADAMI, F.; DUTRA ROSOLEN, M. Fatores de risco cardiovascular em crianças. *Revista Portuguesa de Cardiologia*, 36(10), 699–705, Oct. 2017.
- GABRIELLA, M. et al. ANÁLISE DO PERFIL LIPÍDICO DE CRIANÇAS E ADOLESCENTES EM ESCOLA PÚBLICA DE NATAL-RN. 2018. Available at: <www.conbracis.com.br>.
- GOMES, I. A obesidade e a hipertensão arterial em idade pediátrica – a propósito de uma população em crescimento. *Revista Portuguesa de Cardiologia*, 36(10), 707–708, Oct. 2017.
- GUPTA-MALHOTRA, M. et al. Essential Hypertension vs. Secondary Hypertension Among Children. *American Journal of Hypertension*, 28(1), 73–80, 1 Jan. 2015.
- KUCIENE, R.; DULSKIENE, V. Associations between body mass index, waist circumference, waist-to-height ratio, and high blood pressure among adolescents: a cross-sectional study. *Scientific Reports*, 9(1), 9493, 1 Jul. 2019.
- KURNIANTO, A. et al. Prevalence of Hypertension and Its Associated Factors among Indonesian Adolescents. *International Journal of Hypertension*, 2020, 1–7, 16 Sep. 2020.
- LURBE, E. et al. 2016 European Society of Hypertension guidelines for the management of high blood pressure in children and adolescents. *Journal of Hypertension*, 34(10), 1887–1920, Oct. 2016.



- MANIOS, Y. et al. Prevalence of childhood hypertension and hypertension phenotypes by weight status and waist circumference: the Healthy Growth Study. *European Journal of Nutrition*, 57(3), 1147–1155, 27 Apr. 2018.
- MOHAN, B. et al. Prevalence of sustained hypertension and obesity among urban and rural adolescents: a school-based, cross-sectional study in North India. *BMJ Open*, 9(9), e027134, 8 Sep. 2019.
- NOUBIAP, J. J. Hypertension in children in sub-Saharan Africa: primordial prevention is crucial. *Pan African Medical Journal*, 37, 2020.
- OKPOKOWURUK, F. S.; AKPAN ENOBONG, M. U.; IKPEME, E. Prevalence of hypertension and prehypertension among children and adolescents in a semi-urban area of Uyo Metropolis, Nigeria. *Pan African Medical Journal*, 28, 2017.
- OLIVEIRA, L. H. et al. Estudo transversal das estratégias de tratamento clínico na fibrilação atrial. *Arquivos Brasileiros de Cardiologia*, 98(3), 195–202, Mar. 2012.
- QUADROS, T. M. B. DE et al. Triagem da pressão arterial elevada em crianças e adolescentes de Amargosa, Bahia: utilidade de indicadores antropométricos de obesidade. *Revista Brasileira de Epidemiologia*, 22, 2019.
- REUTER, C. P. et al. Pressão arterial elevada em escolares: fatores sociodemográficos e bioquímicos associados. *Revista Portuguesa de Cardiologia*, 38(3), 195–201, Mar. 2019.
- RIBEIRO, I. , C. P. , & F. A. (2019). Estudo De Pressão Arterial Em Crianças E Adolescentes. *Revista Científica Da Escola Superior de Saúde Dr. Lopes Dias Do Instituto Politécnico de Castelo Branco*, 2019.
- RIBEIRO, I.; COELHO, P.; FERREIRA, A. ESTUDO DE PRESSÃO ARTERIAL EM CRIANÇAS E ADOLESCENTES. *Repositório Científico do Instituto Politécnico de Castelo Branco*, 1, 81–89, Jun. 2019.
- RODRIGUES, P. R. M. et al. Body adiposity is associated with risk of high blood pressure in Portuguese schoolchildren. *Revista Portuguesa de Cardiologia*, 37(4), 285–292, Apr. 2018.
- SOUBEIGA, J. K. et al. Prevalence and factors associated with hypertension in Burkina Faso: a countrywide cross-sectional study. *BMC Public Health*, 17(1), 64, 11 Dec. 2017.
- SUNGWA, E. E. et al. Prevalence and factors that are associated with elevated blood pressure among primary school children in Mwanza Region. *Pan African Medical Journal*, 37, 2020.
- TOZO, T. A. A. et al. Family history of arterial hypertension and central adiposity: impact on blood pressure in schoolchildren. *BMC Pediatrics*, 22(1), 497, 23 Aug. 2022.
- WIRIX, A. J. G. et al. Is the prevalence of hypertension in overweight children overestimated? *Archives of Disease in Childhood*, 101(11), 998–1003, Nov. 2016.
- ZHANG, Q. et al. Hypertension Prevalence Based on Three Separate Visits and Its Association With Obesity Among Chinese Children and Adolescents. *Frontiers in Pediatrics*, 7, 24 Jul. 2019.