

Importance of Early Recognition of Arterial Hypertension in Children and Adolescents: The Nursing Function in Ambulatory Monitoring

Bruno César Fernandes¹ Raquel Borges de Barros Primo² Alan Márcio de Brito Araújo¹ Vanessa Rodrigues Moraes Delgado¹ Anny Karoliny das Chagas Bandeira³, Mariella Rodrigues da Silva¹, Carolina Calixto de Souza Andrade² Kaio Guilherme Campos Paulo Ikeda¹ Michelle Katiuscia Melo Mota¹ Valeska Lopes Pereira¹ Ubirajara Medeiros Costa¹ Eusania Marcia Nascimento¹ Carmen Célia Neves de Souza¹

¹ Brazilian Hospital Services Company – EBSEH. University Hospital of the Federal University of Grande Dourados, Mato Grosso do Sul, Brazil.

² Brazilian Hospital Services Company – EBSEH. Professor Edgard Santos University Hospital of the Federal University of Bahia, Brazil.

³ Jorge Amado University Center, Salvador, Bahia, Brazil.

Abstract

Arterial hypertension is considered an epidemic, remaining as the main cause of death and global disability. As high blood pressure in childhood is highly predictive of high blood pressure in adulthood, there has been a growing interest in the early recognition of this condition in the pediatric population, through outpatient screening in children over three years of age. Objective: to emphasize the importance of routine monitoring of blood pressure measurement in children and adolescents in childcare consultations. Methodology: This is a literature review of published articles, searched through the PubMed, Virtual Health Library and Google Scholar databases. Results: 12 scientific articles were selected as the data source for the present study, seven in English and five in Portuguese. Conclusion: the measurement of blood pressure in all consultations with children is important. If the disease is identified, treatment must be instituted, which will vary between non-pharmacological and pharmacological therapies, which should be introduced for all pediatric patients with blood pressure values above the acceptable percentile for age. In this sense, it is pertinent that nurses acquire and develop skills that make it possible to implement strategies for the prevention of hypertension, as well as the early identification of children and adolescents at risk of arterial hypertension.

Keywords: Hypertension; Child; Blood Pressure Monitoring, Ambulatory.

1. Introduction

For some years now, hypertension (AH) has been considered an epidemic among the adult population and remains the leading cause of death and disability globally. Due to this, there is a growing interest in the

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early recognition of AH in the pediatric population, especially over the last decades, to identify the problem early and prevent its progression and the development of chronic diseases (Salgado and Carvalhães, 2003). It is known that childhood AH is highly predictive of arterial hypertension in adulthood and is proven to be associated with left ventricular hypertrophy, carotid disease, and microalbuminuria. For this reason, given the implications of hypertension and cardiovascular disease in adulthood, early diagnosis is of paramount importance (LEWIS et al., 2017).

However, there is still a lack of convincing evidence for universal screening of healthy children, as the limited evidence is insufficient to assess the balance of the benefits of essential AH screening (primary or idiopathic) in asymptomatic children and adolescents, in the prevention of subsequent cardiovascular disease in childhood or adulthood. However, given the implications of hypertension and cardiovascular diseases in adulthood, early screening has been advocated by different institutions, with the recommendation of blood pressure (BP) measurement in children over three years of age annually, measured in special circumstances in all consultations (LEWIS et al., 2017).

In relation to screening indicators, these seem to vary widely around the world. In the United States of America (USA), for example, ha screening rates are recorded in children from 66% to 97%. Compared to the UK and Australia, rates are between 9% and 22%, equally in other parts of the world. This high rate recorded in the U.S. is related to insurance companies, which encourage screening. However, the difficulty for most clinicians is the classification of BP, the extra time and effort related to access to the reference tables, the lack of adequate equipment to measure blood pressure and the incorrect use of the measurement technique, causes that contribute to the screening being deficient (LALJI and TULLUS, 2018).

It is noteworthy that screening is advocated by international institutes: National Heart, Lung, and Blood Institute (NHLBI), American Heart Association (AHA) and American Academy of Pediatrics (AAP), which recommend that children over three years of age and up to 18 years of age receive a BP measurement at least once a year, and once during all health care episodes (LEWIS et al., 2017).

In view of these premises, this study aimed to emphasize the importance of BP measurement in children and adolescents in childcare consultations, as a way of preventing chronic diseases, considering that the early identification of bp elevations and the conduct of appropriate intervention are necessary measures to mitigate cardiovascular and renal morbidity and mortality in adulthood.

2. Methodology

The study was conducted through an integrative bibliographic review, with data collection in published articles, searched in the PubMed, Virtual Health Library and Google Scholar databases. The inclusion criteria for this review were articles with free text available in full, in Portuguese, Spanish and/or English without limitation of publication date, that is, the studies published throughout the period allowed by the selected databases, because the purpose was to cover as many articles as possible. The repetitions and documents that did not meet the research objective were excluded from the sample, remaining only once. For the selection of articles, a consultation was made to the Descriptors in Health Science (DeCS), and the following descriptors were identified, selected, and used in Portuguese: "Arterial hypertension", "Children"

Importance of Early Recognition of Arterial Hypertension in Children and Adolescents: The Nursing Function in Ambulatory Monitoring and "Ambulatory blood pressure monitoring". The search for studies to make up the analysis sample had as a guide axis the inclusion and exclusion criteria, previously established to maintain coherence in the search for articles and avoid possible vies. These terms were crossed from the Boolean and or OR operators.

In December 2020, therefore, the searches were performed using the descriptors in the fingers bases of those selected in this review.

After a pre-selection of the articles resulting from these searches, readings of the titles and abstracts of the total sample were made, applying the inclusion and exclusion criteria.

After doing this process, 12 articles were selected as the final sample of review analysis. From the material obtained, a thorough reading of its contents was carried out to deepen the knowledge on the subject and achieve the proposed objective.

The articles selected for review were organized by means of an instrument, not validated, elaborated by the authors, containing: title, year of publication, category and focus of the study with the objective of summing up, extracting and analyzing the data.

3. Results and discussion

Twenty scientific articles were selected as a data source for the present study, seven in English and five in Portuguese. The results of the publications selected in this review are described in Table 1.

Table 1. Sumarization of the studies selected for the review

n°	Title of the study	Year	Study category	Study focus
1	Hypertension in childhood	2003	Review article	Critical review of the literature, focusing on practical aspects relevant to the diagnosis and outpatient treatment of children with arterial hypertension. Classic articles and systematic literature review were used through electronic search in medline and lilacs databases in the last 10 years, using the keywords arterial hypertension, newborn, infant, preschool, child and adolescent, selecting those who brought relevant information. The study concluded that early recognition of abnormal blood pressure and appropriate intervention (investigation and treatment) are necessary to decrease future cardiovascular and renal morbidity/mortality.
2	Epidemiology of Risk Factors for Hypertension	2012	Review article	Review of current knowledge of risk factors for hypertension. Genetic and environmental factors, as well as their interaction and biological plausibility

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				<p>were reviewed. Recent data confirm that the interaction of genetics with multiple environmental risk factors explains the high prevalence of hypertension in industrialized countries. The most important modifiable environmental risk factors are high salt intake, alcohol intake, obesity, and low physical activity.</p> <p>The role of stress in the etiology of hypertension is still under investigation, but recent experimental and epidemiological clinical data have shed light on how stress may be related to hypertension. The implications for prevention and treatment are discussed at both the population and individual level. The population approach involves a public health policy aimed at modifying the main risk factors.</p>
3	Child health care: practice of family health nurses	2013	Original article	<p>This qualitative research aimed to analyze the practice of nurses, as well as the facilities and difficulties, for the operationalization of the Program for monitoring the Development and Growth of Children in the Family Health Unit, in the city of Londrina, Paraná. For data analysis, content analysis was used, which allowed us to apprehend the meaning unit of the discourses of five subjects, resulting in the categorization of three themes: child health care: conception of family planning to prenatal care; child health care program: organization of the work process; and nursing consultation: detection and prevention of injuries. The greatest facility for the practice of child care is the bond between the team and the woman during prenatal care and the greater difficulty are cultural factors of the mother and family regarding the adhering to the guidelines in essential care for the child.</p>
4	Family health strategy in primary health actions for	2013	Original article	<p>The objective of this qualitative research was to raise the actions of primary health care for sah patients reported by the family health team with</p>

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	patients with systemic arterial hypertension.			emphasis on the interventions developed by nurses. Descriptive study on the actions of the professionals who make up the ESF. The research was conducted with six members of the ESF from a city in the interior of the state of São Paulo. The physician highlights his role in the unit and characterizes the work of the nursing assistant and the nurse as a "help" in the reception of the patient. The agents value the home visit in which they still do the "promotion". The team recognizes that the nurse has numerous activities in the unit and that he knows the program as a whole, but is burdened with administrative issues. Health education for the prevention of SAH is still incipient. Among the activities raised, those of a strictly curative nature, of control of parameters, which are indicated in the SAH protocol, in which there is still no clear view, on the part of the team members, about the work process for the integrality of the actions are prioritized.
5	Assessment of cardiometabolic risk in children in population studies: underpinning developmental origins of health and disease mother-offspring cohort studies	2015	Review article	The study had two objectives: first, to outline the need to measure cardiometabolic risk in children; and, secondly, to outline how it can be evaluated. The main results considered to have an important development component are CVD, insulin resistance and related metabolic results. Conditions such as metabolic syndrome, type 2 diabetes and AD tend to have a maximum prevalence in middle-aged and older individuals, but cardiometabolic risk assessments in childhood and adolescence are important to define early causative factors and characterize preventive measures. The study summarizes some of the evidence that these factors, when measured in childhood, may be valuable in assessing the risk of cardiometabolic disease in adults and, as such, describes some of the methods for assessing cardiometabolic risk in children.
6	7th Brazilian	2016	Review article	Study conducted by the Brazilian Societies of

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	Arterial Hypertension Guideline			Cardiology, Brazilian Society of Hypertension and Brazilian Society of Nephrology with guidelines and recommendations that reflect the evidence of effectiveness of interventions. The study does not specifically address cost-effectiveness analyses. The main objective of societies and authors is to guide health professionals regarding preventive measures and care for patients with hypertension, aiming to reduce the complications of the disease, considered the most expressive risk factor for cardiovascular diseases.
7	2016 European Society of Hypertension guidelines for the management of high blood pressure in children and adolescents	2016	Review article	The aspects discussed in this study include advances in the definition of hypertension at 16 years or more, clinical significance of isolated systolic hypertension in young people, the importance of out-of-office measurement and central blood pressure, new risk factors for hypertension, methods for assessing vascular phenotypes, grouping of cardiovascular risk factors and treatment strategies, among others. The recommendations of this document summarize a considerable amount of scientific data and clinical experience and represent the best clinical wisdom on which physicians, nurses and family members should base their decisions. In addition, as attention is drawn to the burden of hypertension in children and adolescents, and its contribution to the current epidemic of cardiovascular diseases, these guidelines should encourage policymakers to develop a global effort to improve the identification and treatment of hypertension among children and adolescents.
8	ERICA: prevalences of hypertension and obesity in Brazilian adolescents	2016	Original article	The study aimed to estimate the prevalence of hypertension and obesity and the population attributable fraction of hypertension due to obesity in Brazilian adolescents. Data from the participants of the Study of Cardiovascular Risks in Adolescents, a national school-based sectional

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				<p>study I. The sample was divided into 32 geographical strata and clusters of schools and classes, with national, macroregional and capital representation. Obesity was classified by body mass index according to age and gender. Mean systolic or diastolic blood pressure greater than or equal to the 95th percentile of the reference curve was considered. Prevalence and confidence intervals of 95% (95% CI) of hypertension and obesity were estimated, national and in the macro-regions of the country, by gender and age group, as well as the fractions of hypertension attributable to obesity in the population. Erica was the first Brazilian study with national representativeness to estimate the prevalence of hypertension measured in adolescents. The fraction of the prevalence of hypertension attributable to obesity showed that about 1/5 of hypertensive patients might not be hypertensive if they were not obese.</p>
9	Screening for Hypertension in Children and Adolescents: Methodology and Current Practice Recommendations	2017	Review article	<p>The article aimed to explain key issues that contribute to the inaccurate measurement of blood pressure and incorrect classification of hypertension among children and to present strategies to deal with these issues. The study concludes that a lifelong approach to early screening for hypertension in children is essential to reduce mortality and morbidity associated with vascular impairment. In addition, it emphasizes that adhering to recommended pediatric hypertension guidelines through the use of accurate screening measures and practices and staying abreast of updates to practice guidelines is the first step on the path of healing.</p>
10	What's new in paediatric hypertension?	2017	Review article	<p>The article aimed to explore recent evidence and perceptions about pediatric hypertension focusing on the following topics: prevalence of pediatric hypertension, different sets of normative data, such as bp, screening of hypertension, hypertension</p>

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				<p>diagnoses in certain risk groups, including adolescents and children. Patients with chronic diseases and, finally, salt intake and its contribution to hypertension in children. The study concluded that lifestyle factors such as obesity, high salt intake, processed foods, and immobility are common, and therefore children are more at risk than ever before of developing this disease before only "for adults." The authors pointed out that there is still controversy regarding the definition and diagnosis of hypertension in children, as well as practical issues related to the measurement of BP itself, especially in certain groups (e.g., babies). However, they state that this challenge should not prevent physicians from tracking their patients according to recommended guidelines.</p>
11	<p>Sleep-disordered breathing is associated with blood pressure and carotid arterial stiffness in obese children</p>	2017	Original article	<p>The aim of this study was to evaluate the possible association between sleep breathing disorders (SRD) and BP, and the possible role of endothelial function and local and systemic arterial stiffness in a sample of asymptomatic obese children for sleep disorders. The study results suggest that in obese children asymptomatic for sleep-breathing problems, SRD may worsen BP, in part, through an increase in arterial stiffness.</p>
12	<p>Estimated Change in Prevalence and Trends of Childhood Blood Pressure Levels in the United States After Application of the 2017 AAP Guideline</p>	2019	Original article	<p>Cross-sectional study that analyzed data from the National Health and Nutrition Examination Survey. High blood pressure included hypertension and high blood pressure (according to the 2017 AAP guideline) / prehypertension (according to the NIH/NHLBI guideline of 2004). The analysis included 3,633 children in 2005–2008 and 3,471 children in 2013–2016. According to the 2004 NIH/NHLBI guideline, 3.1% had hypertension in 2005–2008 and 1.9% had hypertension in 2013–2016. According to the 2017 AAP guideline, the prevalence was 5.7% in 2005–2008 and 3.5% in 2013–2016. About 2.5% of children in 2005–2008</p>

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				and 1.5% of children in 2013–2016 were reclassified as hypertensive. A similar change in the prevalence of hypertension was observed after the application of the new guideline. The prevalence of hypertension also decreased from 2005–2008 to 2013–2016 according to both guidelines. The study concluded that although the new guideline reclassified a small proportion of children as having hypertension or high blood pressure, prevalence decreased from 2005 to 2013 to 2016.
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AH is an important modifiable risk factor for cardiovascular morbidity and mortality, both in adolescents and in young adults, being associated with long-term negative effects on health (SALGADO and CARVALHÃES, 2003; AL KIBRIA et al., 2019). It is a multifactorial clinical condition, often associated with metabolic disorders, functional and/or structural alterations of target organs. Although it has no known direct relationship of hypertension with cardiovascular disease in children or adolescents, hypertension is associated with atherosclerosis, ventricular hypertrophy and kidney complications in this population⁴ (AL KIBRIA et al., 2019). In addition, childhood hypertension is associated with higher risks of cardiovascular disease during adulthood (SALGADO and CARVALHÃES, 2003; AL KIBRIA et al., 2019).

The prevalence of high AH or BP may vary according to age, gender and other sociodemographic characteristics among children and adults. Particularly in children tables are used, according to age sex and height percentiles (p). In 2017, the American Academy of Pediatrics (AAP) launched a new Clinical Practice Guideline, which updated the 2004 pediatric hypertension guidance with new thresholds and percentage references (AL KIBRIA et al., 2019).

Normalotensive BP is $< p 90$, high BP $\geq p 90$ and $< p 95$, and BP hypertension \geq to p 95. It is considered HA this year 1 for BP values at is p 95 + 12mmHg and HA is 2 for values $>$ this year 1. Children and adolescents are considered hypertensive when systolic arterial pressure (MAP) and/or diastolic blood pressure (DBP) are higher than p 95, according to age, sex and height percentile, on at least three different occasions⁵ (MALACHIAS et al., 2016). In Europe and the USA, as well as in Brazil, the diagnosis of childhood hypertension is made when BP values, on at least three separate occasions, are confirmed as higher than p 95 for the patient's age, gender and height, or if in adolescents BP exceeds 140/90 mm Hg (LALJI and TULLUS, 2018; MALACHIAS et al., 2016).

It is necessary that every child with presumptive diagnosis of AH be submitted to detailed clinical history and physical examination, and then an investigation script should be made. The younger the child, the greater the chance of effectively treating secondary AH, not applying primary AH, which although it is the most common form in adolescence, its diagnosis is more exclusionary (MALACHIAS et al., 2016).

It is important to highlight that parenchymatous, renovascular and obstructive nephropathies are responsible for approximately 60-90% of these cases of secondary AH, which may affect all age groups

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(infants, children and adolescents) as provided for in the Brazilian guidelines. This evaluation should include an echocardiogram and renal ultrasound (MALACHIAS et al.,2016).

Bp measurement in children is recommended in all clinical assessments after the age of three years, and must comply with established measurement standards. And it should be checked in all children and adolescents ≥ 3 years of age, in all meetings of health cuidados, especially if they are obese (LURBE et al., 2016). In addition, children under three years of age should have BP assessed in specific situations and when there are established risk factors (MALACHIAS et al.,2016).

To perform the measurement, the child should be seated, calm for at least five minutes, with his back supported and his feet supported on the floor, and the use of stimulant foods and beverages should be avoided. The measurement should be done on the right arm, due to the possibility of coarctation of the aorta, supported at the level of the heart (MALACHIAS et al.,2016). When using the oscillometric method and finding high BP ciphers, it should be confirmed by the auscultation method (LURBE et al., 2016).

Cuff size is difficult to determine, and it is necessary to measure the median circumference, which is defined as the midpoint between the acromial of the scapula and olecranon of the elbow, with the shoulder in neutral position and the elbow flexed to 90° , to determine the correct cuff size. The length of the bladder should be 80% to 100% of the arm circumference and the width should be at least 40% (LURBE et al., 2016).

For an auscultatory BP, the stethoscope membrane should be placed over the brachial artery in the antecubital fossa, and the lower end of the cuff should be 2-3 cm above the antecubital fossa. The cuff should be inflated at 20-30 mmHg above the point at which the radial pulse disappears. Excessive inflation should be avoided. The cuff should be emptied at a rate of 2 to 3 mmHg per second; the first (phase I Korotkoff) and the last (phase V Korotkoff) audible sounds should be taken as systolic blood pressure (SBP) and diastolic blood pressure (DBP) respectively. If Korotkoff sounds are heard at 0 mm Hg, the point at which the sound is muffled (Korotkoff phase IV) should be considered as dbp, or repeated measurement with less pressure applied to the brachial artery (LURBE et al., 2016).

Lower-member SBP should be assessed whenever bp measured in upper limbs is elevated. This evaluation can be performed with the patient in a lying position, with the cuff placed in the calf region, covering at least two thirds of the distance between the knee and ankle. The SBP measured in the leg may be higher than in the arm by the phenomenon of amplification of the distal wrist. If leg SBP is lower than sBP measured in the arm, there is a suggestion for a diagnosis of aortic coarctation, being one of the causes of AH that could be diagnosed with detailed physical examination, evaluating BP of the upper and lower limbs and differentiating between the upper and lower peripheral pulses (MALACHIAS et al.,2016).

Children under three years of age should have blood pressure monitoring when there is a history of prematurity < 32 weeks of gestation or in case of young children for gestational age, very low birth weight, or other neonatal complications requiring intensive care, such as umbilical catheterization, congenital heart disease (repaired or unrepaired), recurrent urinary tract infections, hematuria or proteinuria, known kidney disease or urological malformations, family history of congenital kidney disease, solid organ transplantation, malignancy or bone marrow transplantation, treatment with medications known to raise

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blood pressure, other systemic diseases associated with hypertension (neurofibromatosis, tuberous sclerosis, sickle cell anemia, etc.) and evidence of elevated intracranial pressure (LURBE et al., 2016).

Common pharmacological agents associated with bp elevation in children include: decongestants (pseudoephedrine and phenylpropanolamine), caffeine, nonsteroidal anti-inflammatory drugs (IAES). On the other hand, other non-pharmacological etiologies also predispose to AH in children and adolescents, such as some alternative therapies, herbs and nutritional supplements, stimulants for attention deficit/hyperactivity, hormonal contraceptives, steroids, tricyclic antidepressants, illicit drugs such as amphetamines and cocaine (LURBE et al., 2016).

Ambulatory BP monitoring (ANA) is considered in adults as the gold standard, but in children it becomes a challenge, since it is necessary to follow different recommendations, among which stand out the devices authorized to be used, the difficulty to be used in small children and lack of regulations for this method (LALJI and TULLUS, 2018). Even so, it is currently recommended by several guidelines, including the European Hypertension Society, the National High Blood in the USA and the Pressure Education Program Working Group and the Heart Association, but not being as specific in the AAP 2017 guidelines, which notes that amap should not be used to diagnose AH, but it can be a useful complement for outpatient approval after AH is diagnosed (LURBE et al., 2016).

The AMAP allows the measurement of circadian variability, the effect of the white apron (when blood pressure values are persistently elevated within the office, but with measures considered normal in the measurements by AMAP) and detect masked hypertension (LALJI and TULLUS, 2018; LURBE et al., 2016). In addition, it offers valuable information on isolated nocturnal hypertension and abnormal nocturnal descent, phenomena that are often seen in patients with chronic diseases including type 1 diabetes and secondary hypertension, being one of the fundamental recommendations established in the United Kingdom for children who can access and tolerate this diagnostic modality (LALJI and TULLUS, 2018). Recently, a cross-sectional study was conducted that evaluated the estimate of the variation in prevalence and trends of infant blood pressure levels in the USA, after the application of the 2017 AAP Guideline, in which it was observed that the new guideline reclassified a small proportion (2.5%) of children as hypertensive, and a similar proportion was reclassified as having high blood pressure (AL KIBRIA et al., 2019).

When BP is measured repeatedly, as recommended for the diagnosis of AH, the prevalence tends to drop because of the phenomenon of regression to the mean and because the child gets used to the measurement procedure and is more relaxed. Then, the current prevalence of AH in childhood dropped significantly to close to 1.5%. Thus, although the new guideline reclassifies a small proportion of children with hypertension or high blood pressure, the prevalence decreased from 2005-2008 to 2013-2016 (AL KIBRIA et al., 2019).

In Brazil, there are still no adequate studies to assess prevalence, but according to Bloch et al. (2016), according to the first Brazilian study with national representativeness to estimate the prevalence of hypertension measured in adolescents, the results showed that 24% of Brazilian adolescents attending schools in municipalities with more than 100,000 inhabitants are with high BP (prehypertension or

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hypertension) and 25% are overweight. In addition, the prevalence of AH was always higher among adolescents with obesity than among those with adequate weight.

As for race, in the adult population, it is well determined that essential AH has higher prevalence and morbidity and mortality in blacks (KORNITZER et al., 1999). In childhood, this is not yet well established. In addition to genetic factors, environmental factors are equally important in determining blood pressure throughout life. The relationship between genetic and environmental factors begins early, even in the prenatal period (HUANG et al., 2015). These findings suggest that one or more perinatal factors, probably related to maternal and/or fetal nutrition, may permanently alter physiological factors, predisposing the individual to increased risk of late cardiovascular disease (SALGADO and CARVALHÃES; HUANG et al., 2015).

One of the main risk factors is obesity and, in Brazil, its prevalence has shown an important increase in recent decades⁷ (BLOCH et al., 2016). According to the Ministry of Health, throughout Latin America, the prevalence in children aged 5 to 11 years ranges from 18.9% to 36.9% and from 16.6% to 35.8% in adolescents aged 12 to 19 years (BRAZIL, 2017). The fact is that obesity in children is a primary risk factor for AH, and these conditions are associated with 13% of cases. In addition, children with hypertension have an increased risk of becoming hypertensive adults (TAGETTI et al., 2017).

The first step in the evaluation of children or adolescents with high BP is to obtain their history. The various components of history include perinatal history, past medical history, nutritional history, activity history and psychosocial history (LURBE et al., 2016). All children identified as having AH should have their height and weight measured and classified by percentile. In addition to the results of high BP itself and obesity, physical examination in children with AH is usually normal. However, careful examination is mandatory to identify characteristics of alterations that may be the cause of secondary AH, as well as the identification of signs of damage to target organs (MALACHIAS et al., 2016; LURBE et al., 2016).

After the diagnosis of AH, the AAP recommends that all patients should start the investigation phase, which includes different complementary tests including urine test (EAS or urine type 1), blood biochemistry panel, including electrolytes, urea and creatinine, lipid profile (fasting or not fasting to include high-density lipoprotein and total cholesterol), renal ultrasound in children under 6 years of age with altered urine test or altered renal function (AL KIBRIA et al., 2019; LURBE et al., 2016).

In obese patients with body mass index (BMI) > p 95, child or adolescent, in addition to glycosylated hemoglobin, quantification of liver enzymes aspartate transaminase and alanine transaminase (TGO, TGP) is recommended and it is recommended to perform the fasting lipid profile. There are other optional tests to be obtained based on history, such as fasting sera glucose for those at high risk for diabetes mellitus, thyroid stimulating hormone and drug screening test, sleep study (if there is high snoring, daytime sleepiness or history of apnea), and complete blood count, especially in those with growth retardation or abnormal renal function (LURBE et al., 2016).

In Brazil, the VII Brazilian Guideline on AH lists the initial tests in the investigation of hypertension in children and adolescents, mostly similar to those recommended by AAP, but suggests performing entrance imaging tests such as funduscopy, electrocardiogram, doppler cardiogram, and renal USG with Renal

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Artery Doppler (MALACHIAS et al.,2016).

It also suggests that electrolyte scans in urine electrolytes should be performed in children and adolescents with suspected secondary AH, urinary proteinuria, and creatinine, serum levels of anthrin (or plasma-reintic activity) and aldosterone, salivary cortisol, pth parathyroid hormone, thyroid stimulating hormone TSH, free T4 and free T3, hemoglobin electrophoresis, ANA antibodies, anti-DNA, ANCAp and ANCAc, catecholamines and metanephrines in urine and scintigraphy with MIBG. Like AAP, it recommends polysomnography or residential polygraphy if sleep disorders are detected in the anamnesis (MALACHIAS et al.,2016).

From this perspective, it is essential that nurses who work at the outpatient level, especially in childcare consultations, as well as in consultations of children and adolescents in situations of AH, acquire and develop competencies that imply resolution in the face of care challenges in this population, such as the prevention of AH (SOUZA et al.,2013; CAMARGO et al.,2013).

The search for strategies to face these demands has to be based on the creation of bonds with the child/adolescent/family, the co-responsibility of the actors involved in child/adolescent care, the implementation of health education actions, and the surveillance and monitoring actions of risk groups (SOUZA et al.,2013; CAMARGO et al.,2013).

4. Conclusion

In conclusion, this study warns of the importance of blood pressure measurement in all consultations of children and young people, considering that early screening of hypertension in children over three years of age has been recommended by the main institutes and health organizations in the world, with the objective of directing health surveillance policies and prevention of associated chronic diseases in adulthood.

In this sense, it is pertinent that nurses acquire and develop competencies that enable the implementation of strategies to prevent AH, as well as the early identification of children and adolescents at risk of AH, in nursing consultations.

If AH is identified, treatment must be instituted, which will vary between non-pharmacological and pharmacological therapies, which should be introduced for all pediatric patients with BP values above the percentile.

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