



Clinical-epidemiological analysis of pediatric arterial hypertension at Dr. Mario Muñoz Monroy Hospital in Colón, 2024

Análisis clínico-epidemiológico de la hipertensión arterial pediátrica en Hospital Dr. Mario Muñoz Monroy de Colón, 2024

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ABSTRACT

Introduction: Given the belief that high blood pressure in adults originates in childhood, early childhood screening is becoming increasingly common. This consists of elevated systolic and/or diastolic blood pressure values above the 95th percentile for age and sex in at least three measurements, with a six-month interval.

Objective: To characterize high blood pressure in children and adolescents treated at the Dr. Mario Muñoz Monroy Hospital.

Methods: An observational, descriptive, cross-sectional study was conducted in pediatric patients with high blood pressure. Our sample consisted of 88 patients who met the study criteria.

Results: Males predominated (60,2 %) in the 15-18 age group. Obesity was the most common cardiovascular risk factor (35,2 %), primary high blood pressure predominated (94,3 %), and headache was the main clinical symptom.

Conclusions: The findings of this research emphasize that pediatric hypertension is a prevalent and increasing condition, directly associated with the obesity epidemic and unhealthy lifestyle habits, making primary prevention, health promotion, and systematic blood pressure screening priority and urgent health strategies to modify its natural course and prevent its serious complications in adulthood.

Keywords: Hypertension; Child; Adolescent; Risk Factors

RESUMEN

Introducción: dada la máxima que la hipertensión arterial en el adulto tiene su origen en la niñez, cada vez son más frecuentes los estudios en la infancia temprana. La misma consiste en la elevación de las cifras de tensión arterial sistólica y/o diastólica por encima del 95 percentil para la edad y sexo en al menos tres tomas, con un intervalo de seis meses.

Objetivo: caracterizar la hipertensión arterial en niños y adolescentes atendidos en el hospital Dr. Mario Muñoz Monroy.



Métodos: se realizó un estudio observacional, descriptivo y transversal en pacientes de edad pediátrica con hipertensión arterial quedando nuestra muestra constituida por 88 pacientes que cumplieron con los criterios del estudio.

Resultados: El predominio fue del sexo masculino 60,2 % el grupo etario de 15-18 años. La obesidad fue el factor de riesgo cardiovascular más frecuente 35,2 % predominó la hipertensión arterial primaria 94,3 % siendo la cefalea el principal elemento clínico.

Conclusiones: los hallazgos de esta investigación enfatizan que la HTA pediátrica es una entidad prevalente y en ascenso, directamente asociada a la epidemia de obesidad y a hábitos de vida poco saludables, lo que convierte a la prevención primaria, la promoción de salud y el cribado tensional sistemático en estrategias sanitarias prioritarias e impostergables para modificar su curso natural y prevenir sus graves complicaciones en la vida adulta.

Palabras clave: Hipertensión; Niño; Adolescente; Factores de Riesgo

INTRODUCTION

Hypertension (HTN) is a major public health problem worldwide, with a pediatric prevalence ranging from 1,5 % to 2 %. Although classically associated with kidney disease, in recent decades there has been a progressive increase in essential HTN, linked to modifiable risk factors such as obesity, sedentary lifestyle, and atherogenic dietary habits. ^(2,3) This condition, frequently underdiagnosed and asymptomatic, carries a high risk of comorbidity in the medium and long term, and its early detection is a crucial marker of the risk of HTN in adulthood. ^(1,2)

Regular blood pressure (BP) measurement is essential for early identification. The American Heart Association recommends routine blood pressure monitoring during health visits starting at age 3, with specific indications for higher-risk populations. ^(4,5) For pediatric diagnosis, hypertension is defined as systolic or diastolic blood pressure values equal to or greater than the 95th percentile for age and sex on at least three separate readings, a criterion that has increased case identification. ^(4,5) Auscultatory blood pressure measurement with a mercury sphygmomanometer remains the gold standard, requiring a standardized technique to ensure its reliability. ^(6,7)

Despite advances in the management of childhood hypertension, challenges persist in its control and prevention. In the municipality of Colón, Matanzas, there are no published studies addressing this local problem. Therefore, the objective of this research is to characterize arterial hypertension in children and adolescents treated at the "Mario Muñoz Monroy" General Teaching Hospital in Colón.

MATERIALS AND METHODS

An observational, descriptive, and cross-sectional study was conducted at the "Mario Muñoz Monroy" General Teaching Hospital in Colón, Matanzas, Cuba, between June and December 2024.

The study population consisted of 130 children and adolescents aged 5 to 18 years diagnosed with hypertension (HTN) according to the current American Academy of Pediatrics criteria (systolic or diastolic blood pressure $\geq$ 95th percentile for age and sex on at least three measurements).

Inclusion criteria: Patients aged 5 to 18 years. Confirmed diagnosis of HTN according to current pediatric criteria. Hospitalization during the study period due to a hypertensive crisis. Complete medical record available for review. Informed consent signed by parents or legal guardians.

Exclusion criteria: Patients with HTN whose hypertensive crisis was managed exclusively on an outpatient basis. Medical records with incomplete or inconsistent data essential to the study. Refusal to participate in the research by the patient or their legal representative.

The final sample was selected using non-probability convenience sampling, consisting of 88 patients who met all inclusion criteria and none of the exclusion criteria.

Data collection involved a documentary analysis of individual medical records, using a structured form designed for the study. The variables analyzed included:

1- Demographics: age (grouped into 5–9, 10–14, and 15–18 years) and sex.

2- Clinical: type of hypertension (primary or secondary) and main clinical manifestations (headache, chest pain, palpitations, facial flushing, blurred vision, vertigo).



3- Cardiovascular risk factors: obesity, family history of hypertension, dyslipidemia, active or passive smoking, lack of exclusive breastfeeding, prematurity, nephropathy, heart disease, and diabetes mellitus.

The statistical analysis was descriptive. For each categorical variable, absolute and relative percentage frequencies were calculated, and the results are presented in tables created using Microsoft Excel.

The research was guided by the ethical principles of beneficence, non-maleficence, autonomy, and justice, guaranteeing data confidentiality. The study was approved by the institutional ethics committee.

RESULTS

A predominance of males (60,2 %) was found, with the 15-18 age group being the most frequent (56,8 %). (Table 1)

Table 1. Distribution of patients with hypertension by age and sex. "Mario Muñoz Monroy" Hospital. Colón. June to December 2024

Age In years	Sex				Total	
	Female		Male		Total	Total
	No.	%	No.	%	No.	%
5 to 9	6	6,8	5	5,6	11	12,5
10 to 14	10	11,3	17	19,3	27	30,6
15 to 18	19	21,5	31	35,2	50	56,8
Total	35	39,7	53	60,2	88	100

Source: Individual Medical Record

Obesity was the most frequent cardiovascular risk factor observed, at 35,2 %. (Table 2)

Table 2. Distribution according to cardiovascular risk factor

Cardiovascular risk factors	No	%
Obesity	31	35,2
History of hypertension	27	30,6
Dyslipidemia	27	30,6

Smoking	20	22,7
Passive smoking	17	19,3
Lack of exclusive breastfeeding	10	11,3
Prematurity	4	4,5
Nephropathy	4	4,5
Heart disease	2	2,2
Diabetes mellitus	2	2,2

Source: Individual Medical Record

Primary hypertension was the predominant type, accounting for 94,3 % of cases (Table 3).

Table 3. Distribution by age group and type of hypertension

Age in years	Type of hypertension				Total	
	Primary		Secondary			
	No.	%	No.	%	No.	%
5 to 9	6	6,8	5	5.6	11	12,5
10 to 14	27	30,6			27	30,6
15 to 18	50	50			50	56,8
Total	83	94,3	5	5.6	88	100

Source: Individual Medical Record

Headache (89,7 %) and chest pain (69,3 %) were the main clinical manifestations.

Table 4. Distribution according to clinical manifestations

Clinical manifestations	No	%
Headache	79	89,7
Chest pain	61	69,3
Palpitations	57	64,7
Facial flushing	57	64,7

Blurred vision	33	37,5
Vertigo	21	23,8

Source: Individual Medical Record

DISSCUSION

Hypertension (HTN) in the pediatric population represents a growing global health challenge, requiring early diagnostic intervention by healthcare systems to mitigate its long-term consequences and complications. In our study, a clear predominance of HTN was observed in the 15- to 18-year-old group (56,8 %), a finding that coincides with reports from national reviews, such as the one conducted at the "Mártires del 9 de abril" hospital in Sagua la Grande in 2019. The authors believe that this higher frequency in adolescence can be attributed to the hormonal changes characteristic of this stage, which favor the onset and diagnosis of the disease. ^(12,22)

Likewise, a higher incidence was confirmed in males (60,2 %), which is consistent with international pediatric literature describing a male predominance at this stage of life, before the trend reverses in adulthood. ^(16,24) While historically hypertension in children was mainly associated with secondary causes, especially of renal origin, our results reflect a contemporary reality: 94,3 % of cases corresponded to primary hypertension.

This notable increase in essential hypertension is closely related to the rise in childhood obesity and other modifiable risk factors, such as sedentary lifestyles and inadequate dietary habits. This widely documented phenomenon supports the recommendation to begin blood pressure screening and monitoring from the age of three, in order to implement early lifestyle interventions that contribute to reducing future cardiovascular morbidity and mortality. ^(2,13)

The findings of this research reaffirm that the onset of primary hypertension is more frequent from the age of six, as described in the literature, thus differentiating it from secondary hypertension, which usually presents at younger ages and involves more complex blood pressure control, often requiring combination pharmacological therapy. ^(2,18) In this regard, obesity was established as the main associated cardiovascular risk factor (35,2 %), reaffirming its leading role in the development of childhood hypertension and metabolic syndrome. Evidence indicates that its combination with other factors, such as low birth weight, significantly increases the risk of developing hypertension. ^(2,8)

Regarding clinical presentation, although hypertension is often asymptomatic, in our series headache (89,7 %) and chest pain (69,3 %) stood out as the most frequent manifestations, probably because the sample was hospitalized for hypertensive crisis. The authors are concerned that, despite these manifestations, there is evidence that diagnosis is often delayed, as demonstrated by the high prevalence of left ventricular hypertrophy (LVH) reported in national studies at the time of diagnosis, indicating a progression of at least one year. ^(3,18) This diagnostic delay can be attributed, in the authors' opinion, to insufficient risk perception on the part of some healthcare professionals and families, coupled with the lack of a standardized practice for measuring blood pressure during pediatric physical examinations.

The cornerstone of management, both in prevention and treatment, remains lifestyle modification. This includes a healthy diet, regular aerobic exercise, and reducing sedentary behavior. ^(10,15) These measures, in which the family plays a fundamental role, are crucial for slowing the appearance of early signs of atherosclerosis. Childhood is therefore the ideal stage for implementing health promotion and primary prevention strategies, a task in which the entire healthcare team must be actively involved. ^(1,6)

The main limitation of this study lies in its purposive, non-probability sampling design, which was limited to patients hospitalized for hypertensive crises. This introduces a selection bias that prevents the results from being generalized to the entire pediatric population with hypertension, since non-hospitalized or asymptomatic cases are excluded. Furthermore, because this is a cross-sectional study, it is not possible to establish causal relationships between the identified risk factors and the disease. Retrospective data collection from medical records can also lead to information bias or incomplete records.

CONCLUSIONS

The findings of this research emphasize that pediatric hypertension is a prevalent and increasing condition, directly associated with the obesity epidemic and unhealthy lifestyle habits, making primary prevention, health promotion, and systematic blood pressure screening priority and urgent health strategies to modify its natural course and prevent its serious complications in adulthood.

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STATEMENT OF AUTHORSHIP



YOS: Conceptualization, data curation, formal analysis, research, methodology, resources, supervision, validation, visualization, drafting, writing, and editing.

RdICGV: Conceptualization, formal analysis, research, methodology, supervision, visualization, drafting, writing, and editing.

YDR: Conceptualization, formal analysis, research, methodology, supervision, visualization, drafting, writing, and editing.

MJE: Conceptualization, formal analysis, research, methodology, supervision, visualization, drafting, writing, and editing.

AGD: Formal analysis, research, methodology, supervision, visualization, drafting, writing, and editing.

AFAR: Formal analysis, research, methodology, supervision, visualization, drafting, writing, and editing.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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