

EPIDEMIOLOGICAL PROFILE OF OVERWEIGHT AND HYPERTENSIVE CHILDREN AND ADOLESCENTS IN THE STATE OF SÃO PAULO

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Abstract: Systemic arterial hypertension (SAH) in children and adolescents has increased over the years. This scenario portrays a global epidemic that emphasizes the need to be aware of the problem. **Materials and Methods:** Descriptive epidemiological study with a quantitative, exploratory and retrospective approach with data collected from the Registration and Monitoring System - HIPERDIA (DATASUS), referring to adolescents with SAH in São Paulo from January 2002 to April 2013. Analysis and Data processing was carried out using Microsoft Office Excel 2010 Software, where the relative and absolute frequencies of the selected variables were calculated. **Results:** In this period, data from 5,947 participants showed greater female involvement, representing 3,612 cases (60.73%), compared to 2,335 male cases (39.27%). The highest number of cases were recorded in 2002 and 2003, with 1,178 (19.80%) and 1,262 (21.22%), respectively. It is worth noting that only the months of January to April 2013 were analyzed, due to availability in the system. **Discussion:** Studies indicate a close relationship between hypertension and obesity, such that eliminating obesity significantly reduces the number of hypertensive adolescents. Furthermore, it was observed that the prevalence of hypertension in adolescents increases with age. **Conclusion:** The study showed that the majority of adolescents with hypertension are female and are related to being overweight, represented by approximately 43% of overweight hypertensive adolescents. There was a concomitant increase in prevalence according to age. The temporal analysis showed that the number of diagnosed cases decreased between 2002 and 2013, diverging from the literature. This fact can be explained by underreporting or underdiagnosis. In view of the above, it is essential that updated data be collected so that health agencies can formulate public health

policies aimed at the studied population.

Keywords: hypertension; obesity; teenagers

INTRODUCTION

Systemic arterial hypertension (SAH) in adolescents occurs when systolic and/or diastolic blood pressure levels are above blood pressure (BP) 130/80 or up to 139/89 mmHg, according to the Brazilian Society of Pediatrics (2019). In children or those under 13 years of age, the definition is based on percentiles defined according to sex, age and height. BP values above or equivalent to p95 are defined as hypertension.

SAH in this population group has been associated with the recent obesity epidemic. Furthermore, children and adolescents with high blood pressure levels are more likely to become adults with systemic arterial hypertension (Santos et al., 2021).

Adolescence is a crucial period in human development, characterized by significant physical, emotional and social transformations. During this phase, the particularities of adolescence play an important role in health problems, such as obesity and hypertension. The search for independence often leads to challenging food choices and a lifestyle. Adolescents may be more likely to consume processed and calorie-rich foods, while associating this factor with a sedentary lifestyle, contributing to obesity and, consequently, hypertension. In addition to this, genetic inheritance is also an important factor that must be considered.

According to the most recent data collected by the World Health Organization (WHO), in October 2017, 124 million obese children and adolescents were identified worldwide, emphasizing the global pandemic currently being experienced. In Brazil, it is estimated that the prevalence of hypertensive patients in the pediatric population varies from 3 to 15%, according to the Ministry of Health

(2022). Despite its relevance, the Brazilian Society of Pediatrics states that studies on this population are still scarce and that there is no national data that reflects this reality.

Therefore, it is essential to promote healthy eating habits, cultivate physical activity, provide education about health risks and identify these patients early to adopt preventive measures related to risk factors during childhood and adolescence, with the aim of preventing and mitigate possible complications in their health, in addition to establishing solid foundations for a healthy adult life.

Therefore, it is clear that it is essential to conduct new research on overweight in children and adolescents, seeking innovative approaches to promote the health of this target population.

MATERIALS AND METHODS

This is a descriptive epidemiological study with a quantitative, exploratory and retrospective approach whose data were collected from the Registration and Monitoring System (HIPERDIA) - DATASUS, referring to children up to 14 years old and 15 to 19 years old diagnosed with SAH in the State of São Paulo from January 2002 to April 2013. Data from 5,947 patients were analyzed.

It must be noted that there was a time limitation due to the availability of data in the system.

RESULTS

During this period, the number of hypertensive patients diagnosed in the state of São Paulo in the age group of up to 14 to 19 years totaled 5,947 cases, with an annual average of 495 cases and a median of 481. This group represents 0.49% of total registrations obtained during this period. From 2003 to 2004, it is possible to observe a significant drop in registered cases of hypertension in

young people from 1262 to 429 cases, followed by a subtle increase in 2005 with 541 cases and 2006 with 557. Subsequently, a decline was observed until April 2013 reaching 10 registered cases. This time interval is marked by the lowest number of cases during the entire period studied. (Graphic 1)

In the distribution by sex, the data showed a higher frequency in females, representing 60.73% (n=3,612) of the total registered cases, while males are represented by 39.27% (n=2,335). In relation to age group, the Hypertensive and Diabetic Registration and Monitoring System does not differentiate between ages below 14 years, which is represented by 49.41% (n=2,335), and individuals between 15 and 19 years, who make up 50.58% (n=3,008) of the total. Regarding lifestyle, 42.29% (n=2515) are sedentary.

The registered cases were also analyzed according to cardiovascular risk categories. The group with the greatest representation was the medium risk, with 28.85% (n=1716). The other groups obtained similar values, low risk with 9.87% (n=587), high risk with 11.04% (n=657) and very high risk with 9.18% (n=546). However, it is important to consider that the risk was not calculated in 2441 patients. (Graph 2).

When analyzing hypertensive participants, 42.87% (n=2,550) were overweight. Of these, 65.09% (n=1660) are female and 34.58% (n=882) are male. Furthermore, 61.45% (n=1567) have a sedentary lifestyle. When applying the cardiovascular risk category to this group, it is possible to observe that of the 657 cases of young hypertensive people who are at high risk, overweight individuals occupy 85.23% (n=560) of the total and of the 546 who are at very high risk, 49.63% (n=271) are overweight. In relation to the average risk, 50% (n=866) is made up of overweight individuals. (Graph 3).

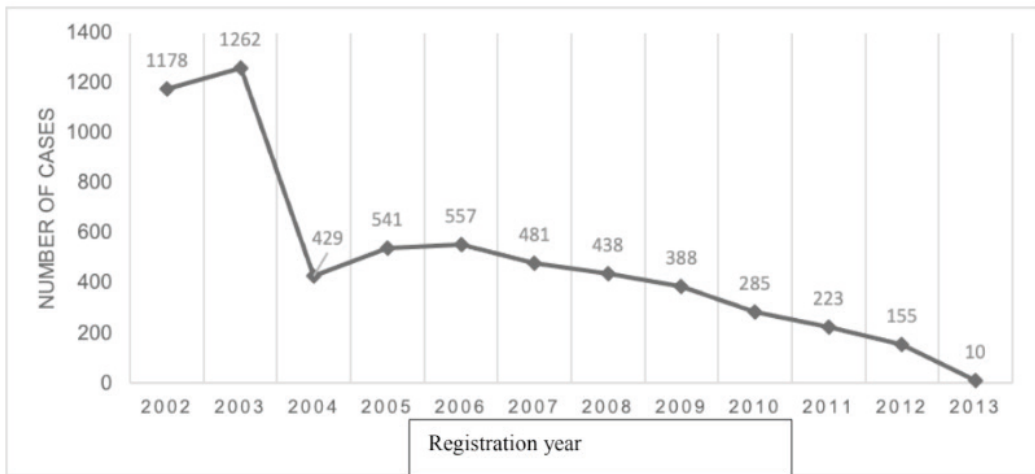
When discussing the age group in overweight hypertensive patients, it is possible to observe the same pattern, but in higher proportions between 15 and 19 years old, with 54% (n=1377) and 46% (n=1173) of individuals aged up to 14 years.

DISCUSSION

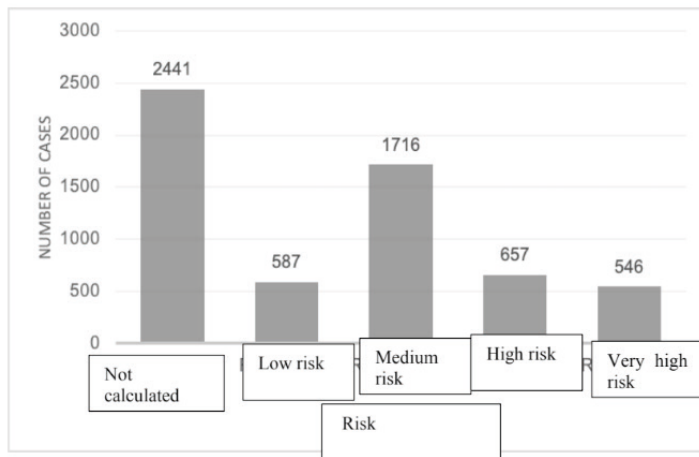
The prevalence and severity of obesity have increased globally in children and adolescents as well as adults (Biro et al., 2010). Based on IBGE data from 2008 to 2009, this prevalence of excess weight in adolescence can also be continuously observed throughout Brazil. 30 years ago these values were estimated at 3.7% among boys and 7.6% among girls. In 2008/2009 the prevalence in girls was 21.7% and 19.4% among boys. Biro (2010) attributes this increase in the number of cases to complex interactions between genetic and environmental factors, with changes in nutritional and physical activity patterns considered most responsible for the increase in adiposity.

Regarding hypertension, in the United States, blood pressure has increased in recent years among children and adolescents. This increase is partially attributable to the increased prevalence of overweight (Muntner et al., 2004). The Study of Cardiovascular Risks in Adolescents (ERICA) (Bloch et al., 2016) showed that almost 1/5 of the prevalence of AH in school adolescents in Brazil can be attributed to obesity. In absolute numbers, around 200 thousand Brazilian teenagers would not have high blood pressure if they were not obese. In this scenario, the elimination of obesity would significantly reduce the number of hypertensive adolescents and future adults with cardiovascular or kidney diseases.

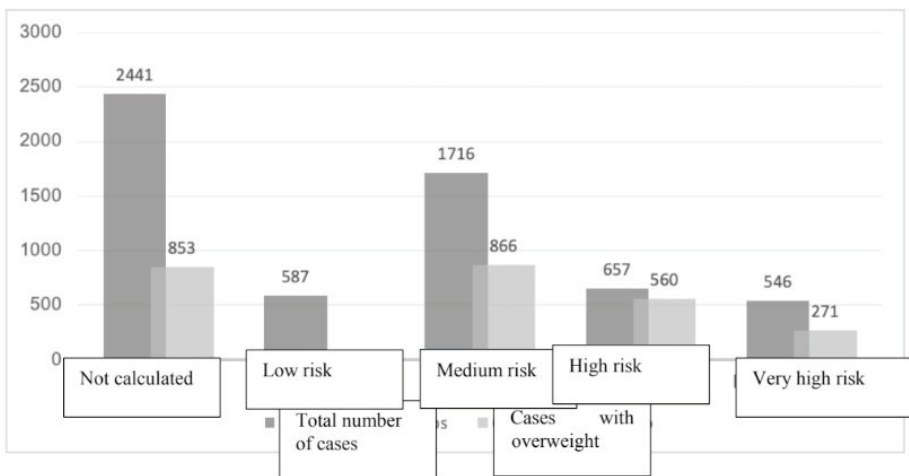
In this study, although 41.04% (n=2441) of the patients analyzed did not present the calculated cardiovascular risk, it was observed that overweight individuals represented



Graph 1: Distribution of cases of children and adolescents by year of registration, in the state of São Paulo, from 2002 to 2013



Graph 2: Distribution of cases of hypertensive children and adolescents, by cardiovascular risk, in the state of São Paulo, from 2002 to 2013.



Graph 3: Distribution of cases of hypertensive children and adolescents and hypertensive and obese children and adolescents, by cardiovascular risk, in the state of São Paulo, from 2002 to 2013.

85.23% (n=560) of the total of hypertensive patients with high risk and of the 546 that present very high risk, 49.63% (n=271) are occupied by overweight hypertensive patients. Therefore, it is possible to observe that overweight individuals occupy a significant portion of patients with high and very high cardiovascular risk.

According to certain literature reviews, some risk factors associated with hypertension in children and adolescents are: excess weight, insulin resistance, dyslipidemia, sleep disorders, factors related to lifestyle such as sedentary lifestyle and diet, in addition to early events related to birth (Moreira et al., 2013).

When relating the results of this study with findings in the literature, there is a divergence, since, based on the data found, the number of hypertensive children and adolescents showed a progressive decline. Based on analyzes of this divergence, it is possible to interpret that the DATASUS tool has been outdated and disused since April 2013, with likely low activity in the last few years of the studied period. Therefore, more recent data that would possibly accompany the global increase in cases cannot be evaluated. The findings of this study reinforce the importance of submitting epidemiological data in the registration and monitoring system (HIPERDIA).

Furthermore, these values, globally, are difficult to recognize. The ERICA study (2016) attributes this deficit mainly to differences in the definition of high BP and the methodology for measuring blood pressure. SAH at younger ages is often asymptomatic and easily unnoticed, even by health professionals, which is why the importance of preventive and curative care among children and adolescents must be emphasized.

In this study, it was possible to verify that the highest percentage of young hypertensive individuals are female, and the proportion is

reinforced when associated with overweight. As also observed by Pinto et al., (2011). However, this fact differs from other literature, in which some males were more numerous (Rosa et al., 2006) and in others no significant statistical difference was found (Ferreira; AYDOS, 2010). The meta-analysis carried out by Magliano et al., (2013) states that the pooled prevalence found in the systematic study for both sexes was high and, furthermore, indicates that systemic arterial hypertension must be monitored in the population aged 10 to 20 years.

It is also possible to verify that the prevalence of high blood pressure in adolescents increases with age, and this data is corroborated by the study by Bloch et al., (2016) and Rosa et al., (2006), which identified a higher concentration of high blood pressure in patients between 15 and 19 years old, when compared with younger individuals, as well as the present study.

CONCLUSION

The study demonstrated that the majority of children and adolescents diagnosed and monitored with hypertension and overweight are female. The predominant age group is between 15 and 19 years old, showing an increase in prevalence depending on age. Regarding cardiovascular risk, overweight individuals occupy a significant portion of patients with high and very high cardiovascular risk. The temporal analysis showed that the number of registered cases decreased between 2002 and 2013, diverging from the literature.

The study's limitation was the unavailability of data, which was restricted to April 2013. The information base made available by the Ministry of Health - Hypertensive and Diabetic Registration and Monitoring System (HIPERDIA) has been devoid of updates for more than 10 years, which makes analysis based on recent data impossible and makes

the recognition of the population in question and its associated risk factors difficult to be accurate.

To know the epidemiological profile of adolescents is essential so that health bodies can formulate public health policies,

therefore it is recommended to carry out data collection, insertion into the Hypertensive and Diabetic Registration and Monitoring System (HIPERDIA) and studies to investigate the possible causes of the divergences with the literature obtained in the present study.

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