ISSN: 0975-3583, 0976-2833 VOL14, ISSUE02, 2023

A PROSPECTIVE STUDY OF AETIOLOGICAL AND CLINICAL PROFILE OF HYPERTENSION IN CHILDREN

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Abstract

Introduction: In India and other developing countries, childhood hypertension is an underreported problem, and it is frequently reported in adults. A systematic analysis for the global burden of disease study 2016 reported 10.2 million deaths and 208 million Disability Adjusted Life Years (DALY) in hypertensive patients. Increased blood pressure (BP) has been linked to an increased risk of cardiovascular disease and end-stage renal disease in both the paediatric and adult populations.

Materials and Methods: This is a cross-sectional study. Children between 3 and 15 years of age who visited the outpatient & inpatient Department of Pediatrics, Kakatiya Medical College and MGM Hospital, Hanumakonda, were screened for the presence of hypertension between January 2022 to December 2022. After explaining the intent of this study, its objective & its methodology to the parents of all children who were included in the study a written consent from parents / guardian accompanied were taken. Hypertension was classified according to fourth report. Systematic investigations were done to find out the aetiology of hypertension.

Results: Blood pressure was measured, BMI of all patients was calculated and a predesigned proforma was filled which included the details about each patient. Maximum number of patients were in age group of 3 to 9 (total 30 patients) 48.3 %. Second maximum number of patients were age group of 12 to 15 yrs. (total 20 patients) 32.2 %. On age group of 9 to 12 yrs. (total 12 patients) 19.3 %. In the study maximum number of patients were underweight, 56 patients (90.3 %) with BMI <18.5, followed in frequency with 4 patients (6.4 %) having BMI 18.5-25, 2 patients having BMI > 25.

Conclusion: It has been observed that minimum number of patients were in age group 9-12 years patients (19.3 %) and maximum number of patients were in the age group 3 - 9 years (51.6

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE02, 2023

%) with a M : F ratio of 1 : 0.93. and the main aetiology of hypertension was found to be nephrotic syndrome. In this study maximum patients were underweight; there was no relation between increasing weight and hypertension.

Key Words: childhood hypertension, BMI, weight, end-stage renal disease.

INTRODUCTION

In India and other developing countries, childhood hypertension is an underreported problem, and it is frequently reported in adults. A systematic analysis for the global burden of disease study 2016 reported 10.2 million deaths and 208 million Disability Adjusted Life Years (DALY) in hypertensive patients. Increased blood pressure (BP) has been linked to an increased risk of cardiovascular disease and end-stage renal disease in both the paediatric and adult populations.[1]

Children's hypertension is gradually increasing. Children with childhood hypertension have early cardiovascular and renal morbidity and mortality, as well as end organ damage and hypertensive encephalopathy. In the majority of children, hypertension is associated with an underlying disorder.[2] Hypertension can appear for the first time without being associated with a cardiovascular or renal disorder. In 1963, the prevalence of paediatric population hypertension was investigated. The majority of studies show a range of 1 to 5%. Some geographical areas have reported as high as 10% prevalence.[3]

Some children may experience anxiety during evaluations, resulting in elevated blood pressure that is in the hypertensive range but is normal when monitored at home.[4] This phenomenon of "white coat" hypertension can be diagnosed using a 24-hour ambulatory blood pressure monitor, which collects a large number of blood pressure measurements in the child's home environment. Children with white coat hypertension should be monitored every 6 months because they are at an increased risk of developing chronic hypertension.[5]

The primary objective of this study was to determine the incidence of hypertensive emergencies, the clinical presentation and etiological diagnosis at different age groups and to assess the real burden of primary hypertension in causing hypertensive emergencies in children.

MATERIALS AND METHODS

This is a cross-sectional study. Children between 3 and 15 years of age who visited the outpatient & inpatient Department of Pediatrics, Kakatiya Medical College and MGM Hospital, Hanumakonda, were screened for the presence of hypertension between January 2022 to December 2022.

Hypertension was classified according to fourth report. Systematic investigations were done to find out the aetiology of hypertension.

Exclusion Criteria: Age < 3 yrs. or age above 15 yrs.

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Methodology: After explaining the intent of this study, its objective & its methodology to the parents of all children who were included in the study a written consent from parents / guardian accompanied were taken. All children coming to the outpatient & inpatient Department of Pediatrics, Kakatiya Medical College and MGM Hospital, Hanumakonda, between January 2022 to December 2022 were screened for the presence of hypertension.

Statistical Analysis: All the data were collected and analysed using Microsoft Excel and EPI Info software 3.4.3. Results were calculated using percentages.

RESULTS

Blood pressure was measured, BMI of all patients was calculated and a predesigned proforma was filled which included the details about each patient.

Maximum number of patients were in age group of 3 to 9 (total 30 patients) 48.3 %. Second maximum number of patients were age group of 12 to 15 yrs. (total 20 patients) 32.2 %. On age group of 9 to 12 yrs. (total 12 patients) 19.3 %.

S.No	Age group	N (%)
1	3-9 years	30 (48.3%)
2	9-12 years	12 (19.3%)
3	12-15 years	20 (32.2%)

Table 1: Age distribution

S.No	Gender	N (%)
1	Male	32(52%)
2	Female	30(48%)
3	Total	62 (100%)

Table 2: Sex Distribution

S.No	BMI	N (%)
1	<18.5	56 (90.3%)
2	18.5-25	4 (6.4%)
3	>30	2 (3.2%)
4	Total	62 (100%)

Table 3: Distribution according to BMI

In the study maximum number of patients were underweight, 56 patients (90.3 %) with BMI <18.5, followed in frequency with 4 patients (6.4 %) having BMI 18.5-25, 2 patients having BMI > 25.

S.No	clinical presentation	N (%)
1	Fever	30 (48.3%)
2	Cough and cold	10 (16.1%)
3	Headache	28 (22.5%)

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE02, 2023

4	Vomiting	40 (32.2%)
5	Decrease urine output	24 (38.7%)
6	Abdominal pain	2 (3.2%)
7	Altered sensorium	4 (6.4%)
8	Burning of vision	6 (9.6%)
9	Rashes	8 (12.9%)
10	Generalized edema	40 (64.5%)

Table 4: Distribution based on clinical presentation

In the study the commonest symptom was generalized oedema in 40 patients (64.5 %), fever in 30 patients (48.3 %), decreased urine output in 24 patients (38.7 %), vomiting in 40 patients (32.2 %), headache in 28 patients (22.5 %), cough & cold in 10 patients (16.1 %), rashes in 8 patients (12.9 %), blurring of vision in 6 patients (9.6 %), altered sensorium in 4 patients (6.4 %) and abdominal pain in 2 patients.

S.No	Aetiology	N (%)
1	Nephrotic syndrome	16 (25.8%)
2	Post streptococcal glomerulo nephritis	14 (22.5%)
3	Renal artery stenosis	8 (12.9%)
4	Chronic kidney disease	4 (6.4%)
5	Systemic lupus erythematous	4 (6.4%)
6	Henoch scholein purpura nephritis	6 (9.6%)
7	Juvenile dermatomyositis	2 (3.2%)

Table 5: Distribution Based of Aetiology

Nephrotic syndrome was found as the most common cause & found in 16 patients (25.8 %), followed by post streptococcal glomerular nephritis in 14 patients (22.5 %), 8 patients (12.9 %) had chronic kidney disease, 8 patients (12.9 %) of renal artery stenosis, SLE (Systemic Lupus Erythematosus) was found in 4 patients (6.4 %), others had uncommon causes like Henoch-Schonlein purpura nephritis seen in 6 patients (9.6 %) & 2 patients (3.2 %) with juvenile dermatomyositis

DISCUSSION

Krishna et al conducted a study in children aged 3 to 18 years, and their findings revealed that the most children with hypertension were 14 years old, with the least number of children being 4-5 years old. In comparison to Krishna et al, my study had the greatest number of hypertensive children aged 3-9 years, followed by children aged 12 to 15 years.

Durrani et al conducted a study with 701 school-aged children in Aligarh between the ages of 12 and 16. In his study, the highest prevalence of hypertension in both sexes was observed at 15

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE02, 2023

years of age (19.5% in boys and 16.66% in girls), followed by 13 years (9.83% in boys and 11.61% in girls) 3. In comparison to Durrani et al's study, the majority of children with hypertension in my study were aged 3-9 years (51.6%), followed by 12-15 years (32.2%).[6]

Buch et al conducted a study of hypertensive schoolchildren aged 6 to 18 in Seurat City. The study discovered that the prevalence of hypertension rises with age. In contrast to the study of Buch et al, my study found no increase in the prevalence of hypertension with increasing age.[7]

Shah et al conducted a study on the prevalence of hypertension and its association with obesity, and their findings revealed that females had a higher prevalence of hypertension (23.82%) than males (14.7%). In comparison to Shah et al's study, my study had a higher prevalence of female hypertension patients than males, with 16 male patients (51.6%) and an overall sex ratio of 1:0.93 male: female ratio.[8]

Mohan et al conducted a study of elevated blood pressure in obese children in Ludhiana, concluding that males outnumbered females in both urban and rural areas. In comparison to Mohan et al's study, my study has more male patients than female patients, but the difference is not as large.[9]

Sayeemuddin et al conducted a study on the blood pressure profiles of school children, concluding that blood pressure (systolic and diastolic) increases with height, age, weight, and BMI. In contrast to the previous study, this one found no evidence of an increasing trend of hypertension with age. In this study the commonest symptom was fever in 30 patients (48.3 %), generalised oedema in 40 patients (64.5 %), and decreased urine output in 24 patients (38.7 %).[10]

Khalil et al conducted a study of clinical profile and aetiology in paediatric hypertension, concluding that the most common clinical feature found was headache in 13 patients (52.5%), followed by oedema in 9 patients (39.1%). Yang et al. conducted a study of hypertension in children in the emergency department, and their findings revealed that dizziness and headache were the most common presenting symptoms in adolescent age.

Kota et al conducted a clinical analysis of hypertension in children, finding that the most common causes are glomerulonephritis, endocrine disorders, and renovascular disease. Takayasu's disease was the most common cause of renovascular hypertension discovered. Bagga et al conducted a study to investigate the aetiology and clinical profile of children with chronic hypertension. Their research concluded that the most common causes are glomerulonephritis (GN), obstructive uropathy, and reflux nephropathy. Commonest cause for renovascular hypertension was Takayasu's disease.

CONCLUSION

It has been observed that minimum number of patients were in age group 9-12 years patients (19.3 %) and maximum number of patients were in the age group 3 - 9 years (51.6 %) with a M :

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F ratio of 1 : 0.93. and the main aetiology of hypertension was found to be nephrotic syndrome. In this study maximum patients were underweight; there was no relation between increasing weight and hypertension.

REFERENCES

1. Kaplan NM, Opie L.H. Controversies in hypertension. Lancet 2006; 367: 168-176.
2. Hogg RJ, Fruth S, Lemley KV, Portman R, Schwartz GJ, Coresh J et al. National Kidney Foundation's Kidney Disease Outcomes Quality Initiative clinical practice guidelines for chronic kidney disease in children and adolescents: Evaluation, classification and stratification. Pediatrics 2003; 111: 1416-1421.
3. Fenves AZ, Ram CV. Drug treatment of hypertensive urgencies and emergencies. Semin Nephrol 2005; 25: 272-280.
4. Calvetta A, Martino S, Von Viger RO, schmidtko J, Fossali E, Bianchetti MG. What goes up must immediately come down! Which indication for short acting nifedipine in children with arterial hypertension? Peditr Nephrol 2003; 18: 1-2.
5. Yiu V, Orrbine E, Rosychuk RJ, Mac Laine P, Goodyer P, Girardin C et al. the safety and use of short acting nifedipine in hospitalized hypertensive children. Pediatr Nephrol 2004; 19: 644-650.
6. Hansen ML, Gunn PW, Kaelber DC. Under diagnosis of hypertension in children and adolescents. JAMA 2007; 298(8): 874-879.
7. M. Behjati, K.Barkhordari. The Relation between Blood Pressure and Body Mass Index in Iranian School Age Children. Iran j Med Sci 2006; 31(1): 33-36.
8. Wyszynska T, Cichoka E, Wieteska-Kimczak A, Januszewickz P. A single pediatric centre experience with 1025 children with hypertension. Acta Pediatr 1992; 81: 244-246.
9. Gill DG, Mendis DA, Costa B, Cameron JD, Joseph MC, Ogg CS, Chantler C. Analysis of 100 children with severe and persistent hypertension. Arch Dis Child 1976; 51: 951-956.
10. Arar MY, Hogg RJ, Arrant Jr BS, Seikaly MG. Etiology of sustained hypertension in children South Western United States.Pediatr Nephrol 1994; 8: 186-189.