

A prospective study of aetiological and clinical profile of hypertension in children**Naveen Kumar Reddy A^{1*}, A.Chandrasekhar Reddy²**¹*Associate Professor, Department of Paediatrics, Viswabharathi Medical College, Penchikalpadu, Kurnool Andhra Pradesh, India*²*Consultant, GVR Children Hospital, Kurnool Andhra Pradesh, India*

Received: 29-10-2020 / Revised: 30-11-2020 / Accepted: 24-12-2020

Abstract

Introduction: There is a gradual increase in hypertension among children. Early cardiovascular and renal morbidity and mortality are seen in children with childhood hypertension along with damage to the end organs and hypertensive encephalopathy. **Materials and Methods:** This is a cross-sectional study. Children between 3 and 15 years of age who visited the outpatient & inpatient Department of Paediatrics, Viswabharathi Medical College, Penchikalpadu, Kurnool, were screened for the presence of hypertension between June 2018 to June 2020. Hypertension was classified according to fourth report. Systematic investigations were done to find out the aetiology of hypertension. **Results:** Maximum number of patients was in the age group of 3 to 9 years, followed by 12 to 15 years and 9 to 12 years age groups. Males were affected more. Nephrotic syndrome was the commonest cause of hypertension in children. **Conclusion:** In this study, 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 : F ratio of 1 : 0.93. and the main aetiology of hypertension was found to be nephrotic syndrome. In this study maximum patients were under weight; there was no relation between increasing weight and hypertension.

Keywords: Nephrotic syndrome, Hypertension

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Introduction

There is a gradual increase in hypertension among children. Early cardiovascular and renal morbidity and mortality are seen in children with childhood hypertension along with damage to the end organs and hypertensive encephalopathy[1]. In most of children, hypertension accompany with underlying disorder. Hypertension can be present for the first time without features of a cardiovascular or renal disorder[2]. The prevalence of paediatric population hypertension was examined at 1963. In most of the studies the range is from 1 to 5 percent. As high as 10 percent prevalence is reported for some of the geographic areas[3].

Materials and methods

This is a cross-sectional study. Children between 3 and 15 years of age who visited the outpatient & inpatient Department of Paediatrics, Viswabharathi Medical College, Penchikalpadu, Kurnool, were screened for the presence of hypertension between June 2018 to June 2020. 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.

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 Paediatrics at Sri of Paediatrics, Viswabharathi Medical College, Penchikalpadu, Kurnool between June 2018 to June 2020 were screened for the presence of hypertension.

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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.

Age Distribution: Maximum number of patients was in age group of 3 to 9 (total 15 patients) 48.3 %. Second maximum number of patients was age group of 12 to 15 yrs. (total 10 patients) 32.2 %. On age group of 9 to 12 yrs. (total 6 patients) 19.3 %.

Sex Distribution (N = 31): In the study out of 31 patients, 15 were female patients (48.3 %) and 16 male patients (51.6 %), with overall sex ratio of 1 : 0.93 (male : female).

BMI Distribution: In the study maximum number of patients were underweight, 28 patients (90.3 %) with

BMI < 18.5, followed in frequency with 2 patients (6.4 %) having BMI 18.5 -25, one patient having BMI > 25.

Clinical Presentation (N = 31): In the study the commonest symptom was generalized oedema in 20 patients (64.5 %), fever in 15 patients (48.3 %), decreased urine output in 12 patients (38.7 %), vomiting in 10 patients (32.2 %), headache in 7 patients (22.5 %), cough& cold in 5 patients (16.1 %), rashes in 4 patients (12.9 %), blurring of vision in 3 patients (9.6 %), altered sensorium in 2 patients (6.4 %) and abdominal pain in one patient.

Aetiology of Hypertension: Nephrotic syndrome was found as the most common cause & found in 8 patients (25.8 %), followed by post streptococcal glomerular nephritis in 7 patients (22.5 %), 4 patients (12.9 %) had chronic kidney disease, 4 patients (12.9 %) of renal artery stenosis, SLE (Systemic Lupus Erythematosus) was found in 2 patients (6.4 %), others had uncommon causes like Henoch-Schonlein purpura nephritis seen in 3 patients (9.6 %) & 1 patient (3.2 %) with juvenile dermato-myositis.

Table 1: Age Distribution

S.No	Age Group	Number	Percentage
1	3-9 years	15	48.3%
2	9-12 years	10	32.2%
3	12-15 years	6	19.3%

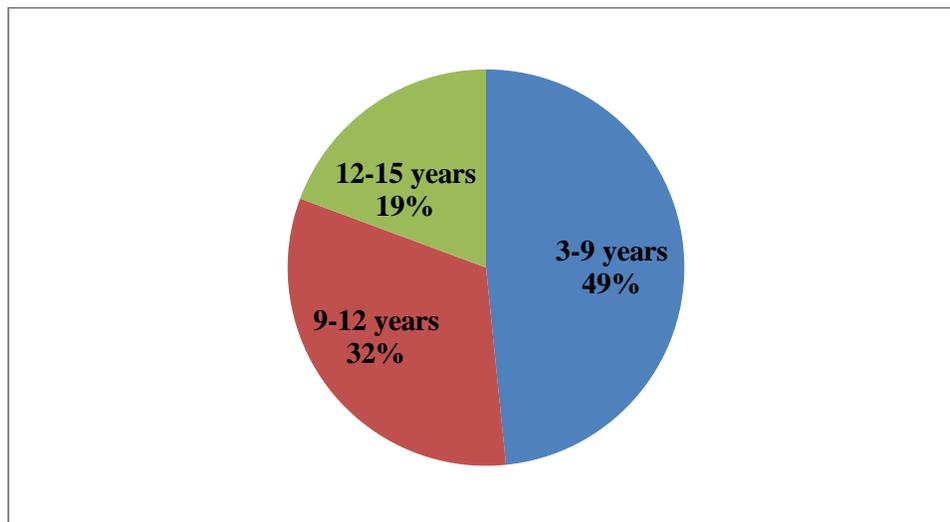


Fig 1: Age Distribution

Table 2: Gender Distribution

S.No	Gender	Number	Percentage
1	Male	16	51.6%
2	Female	15	48.3%
3	Total	31	100%

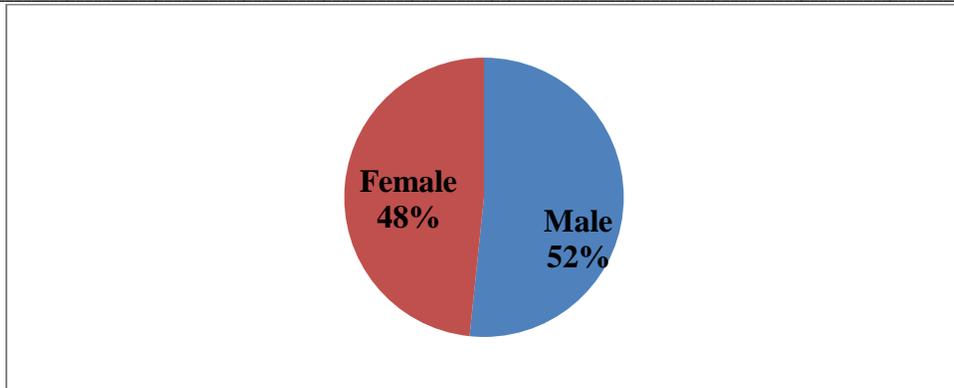


Fig 2: Gender Distribution

Table 3: BMI Distribution

S.No	BMI	Number	Percentage
1	≤18.5	28	90.3%
2	18.5-25	2	6.4%
3	>25	1	1.96%

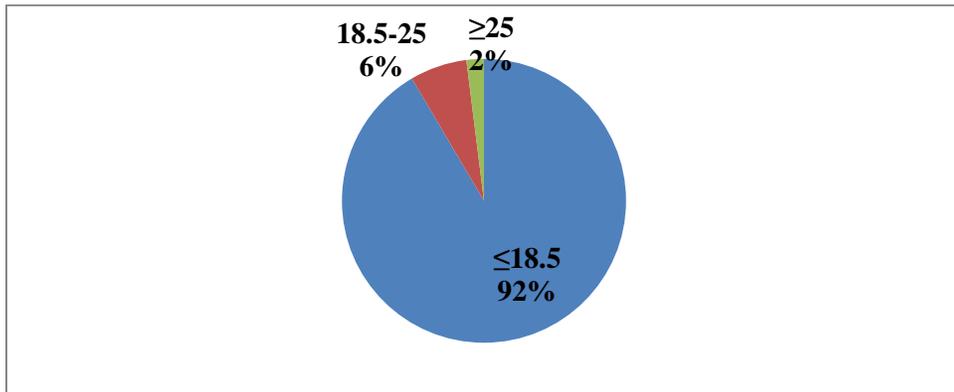


Fig 3: BMI Distribution

Table 4: Clinical Presentation

S.No	BMI	Number	Percentage
1	Oedema	20	64.5%
2	Fever	15	48.3%
3	Decreased Urine Output	12	38.7%
4	Vomiting	10	32.2%
5	Headache	7	22.5%
6	Cough & Cold	5	16.1%
7	Rashes	4	12.9%
8	Blurred Vision	3	9.6%
9	Altered sensorium	2	6.4%
10	Abdominal pain	1	1.96%

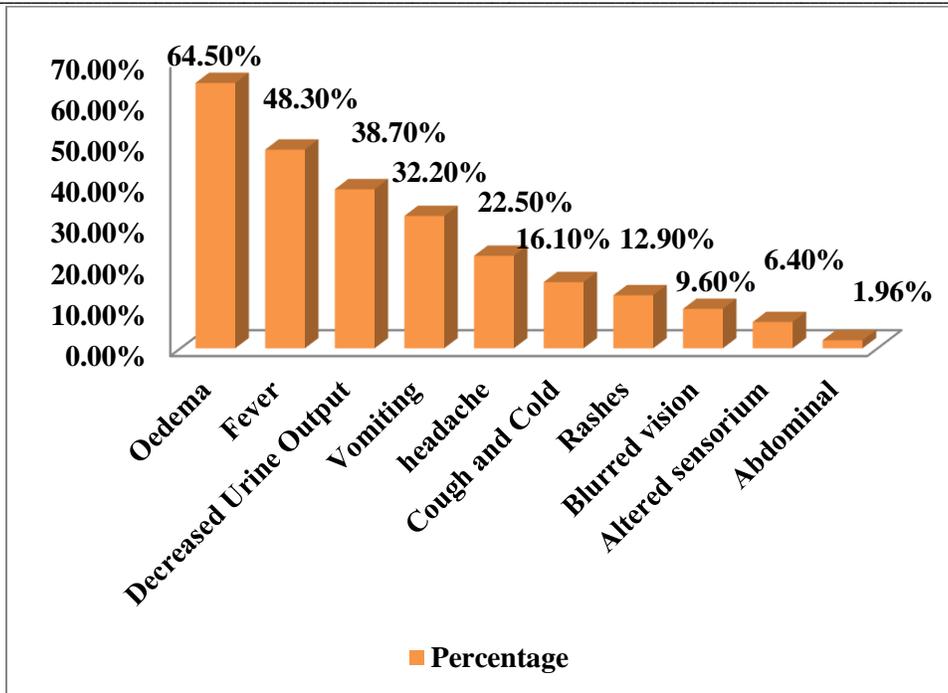


Fig 4: Clinical presentation

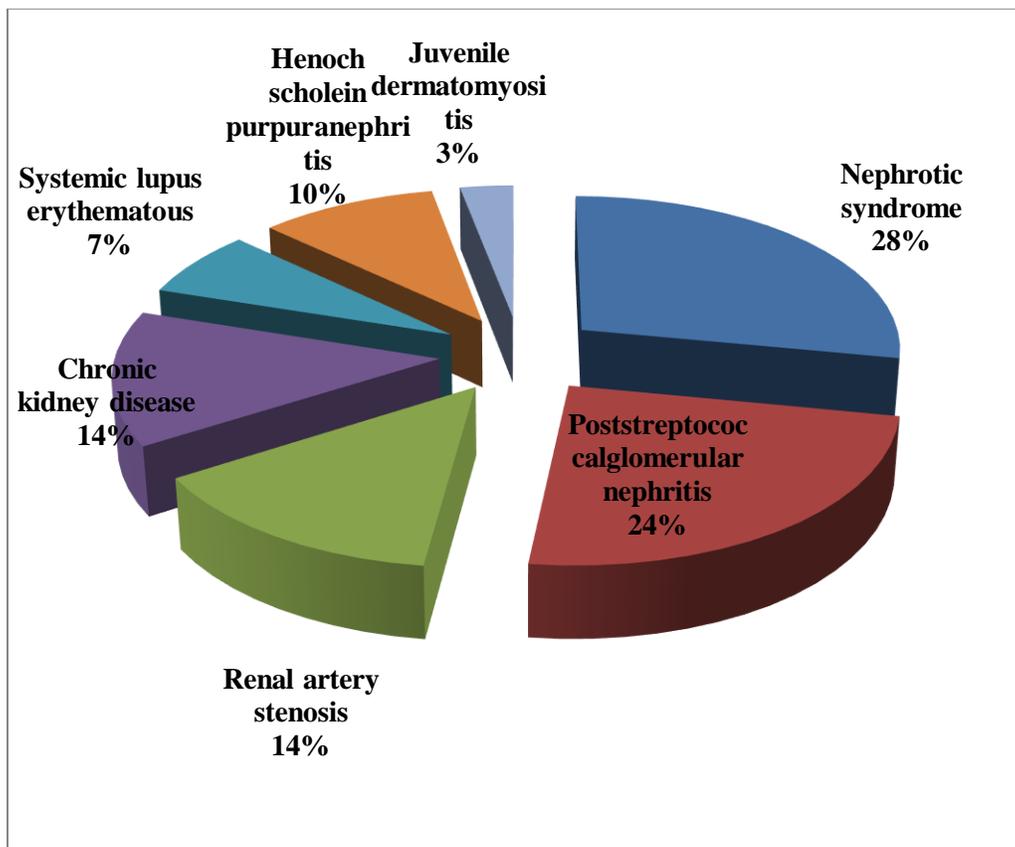


Fig 5: Distribution Based of Aetiology

Discussion

Verma et al, did a study in 1995 in Punjab city to evaluate the profile of BP in school children between the age of 5 to 15 years, their study concluded that blood pressure showed an abrupt increase in age between 11 -13 years in girls whereas in boys this increase seen between 12 and 13 years.

In comparison to Verma et al and our study the BP was mainly seen between the age group 3 -9 years in both the sexes. There after there was maximum number of patients was in age group 12 -5 years but there was no such difference found in blood pressure rise in both the sexes[4]. Krishna et al did a study in children of age group 3 -18 years, and their study conclude maximum number of children having hypertension was of age group 14 years and minimum number of children in age group 4 -5 years were found to be hypertensive. In comparison to Krishna et al my study had maximum number of children who were hypertensive in age group 3 -9 years, followed by children of age between 12 to 15 years[5,6]. Durrani et al did a study among 701 school going children in Aligarh in age group 12 -16 years. In his study highest prevalence of children with hypertension was observed in 15 years of age in both the sexes 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 Durrani et al study my study had maximum children with hypertension in the age group 3 -9 years (51.6 %) followed by 12 -15 years (32.2 %) [7]. Buch et al did a study of children at school with hypertension at Surat city aged 6 -18 years. The study observed that prevalence of hypertension increases with age. In comparison to study of Buch et al my study did not show any increase in prevalence of hypertension with increasing age[8]. Shah et al did a study on prevalence of hypertension & association with obesity, their study concluded that hypertension prevalence was more in females (23.82 %) in comparison to males (14.7 %). In comparison to study of Shah et al my study had prevalence of more female patients with hypertension in comparison to males, 16 male patients (51.6 %), with overall sex ratio of 1 :0.93 male: female ratio. Mohan et al did a study of raised blood pressure in obese children in Ludhiana, his study concluded males outnumbered the females in both urban and rural areas. In comparison to study of Mohan et al my study there are more male patients than female, but the difference was not so large[9]. Sayeemuddin et al did a study on blood pressure profile of school children the study concluded that the blood pressure (systolic and diastolic) increases with height, age, weight and BMI. In comparison to the above study

this study had no such relation of increasing trend of hypertension with increasing age. In this study the commonest symptom was fever in 15 patients (48.3 %), generalised oedema in 20 patients (64.5 %), and decreased urine output in 12 patients (38.7 %). Khalil et al did a study of clinical profile and aetiology, paediatric hypertension, their study concluded that commonest clinical feature found was headache in 13 patients (52.5 %), followed by oedema in 9 patients (39.1 %). Yang et al., did study of hypertension in children in emergency department, their study found dizziness and headache as the most common presenting symptom in adolescent age. Kota et al did a study of clinical analysis of hypertension in children, the chief causes include glomerulonephritis, endocrine disorders, and renovascular disease. Commonest cause found for renovascular hypertension was Takayasu's disease. Bagga et al did a study, to study the aetiology and clinical profile of children with sustained hypertension. Their study concluded that main causes includes glomerulonephritis (GN), obstructive uropathy and reflux nephropathy. Commonest cause for renovascular hypertension was Takayasu's disease. Still et al did a study on severe hypertension in childhood, their study found (64 %) evidence of pyelonephritis, either on renal biopsy or at necropsy in approximately half (16 cases) of the cases. There had been a previous history of urinary infection, the original infection occurring under 6 months of age in 50 % and under 3 years in 90 % [10].

Conclusion

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

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Conflict of Interest: Nil

Source of support: Nil