

A prospective study of clinical profile of hypertension in children

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Abstract

Introduction: Hypertension is a persistent elevation of arterial Blood Pressure (BP) above levels defined as normal. It is a public health challenge for societies, not only in adults, but also in children in socioeconomic and epidemiological transition and one of the most important risk factors for cardiovascular death accounting for 20-50% of all deaths[2]. Primary (essential) hypertension occurs more commonly in adults, and if untreated, is a major risk factor for myocardial infarction, stroke and renal failure. **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, BRD Medical College, Gorakhpur, Uttar Pradesh, were screened for the presence of hypertension between January 2020 to December 2020. Hypertension was classified according to fourth report. Systematic investigations were done to find out the aetiology of hypertension. **Results:** 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. **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 underweight; there was no relation between increasing weight and hypertension.

Key Words: Hypertension, nephrotic syndrome, myocardial infarction, stroke and renal failure.

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Introduction

Hypertension is a persistent elevation of arterial Blood Pressure (BP) above levels defined as normal[1]. It is a public health challenge for societies, not only in adults, but also in children in socioeconomic and epidemiological transition and one of the most important risk factors for cardiovascular death accounting for 20-50% of all deaths[2]. Primary (essential) hypertension occurs more commonly in adults, and if untreated, is a major risk factor for myocardial infarction, stroke and renal failure. Hypertensive children although usually asymptomatic already manifest evidence of target organ damage. Up to 40% of hypertensive children have left ventricular hypertrophy or features of early atherosclerosis. Primary hypertension often tracks into adulthood. Children with blood pressure >90thpercentile have 2-4 fold greater risk of having hypertension as adults. Similarly, nearly half of hypertensive adults had a BP of >90thpercentile as children. In infants and young children, systemic hypertension is uncommon with a prevalence of <1%, but when present, is often indicative of an underlying disease process. Severe and symptomatic hypertension in children is usually secondary. In contrast, the prevalence of primary essential hypertension mostly in older school age children and adolescents has increased in prevalence in parallel with obesity.

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, BRD Medical College, Gorakhpur, Uttar Pradesh, were screened for the presence of hypertension between January 2020 to December 2020. Hypertension was classified according to fourth report.

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Systematic investigations were done to find out the aetiology of hypertension.

Exclusion Criteria

Age < 3 yrs. or age above 15 yrs

Methodology

Ethical clearance for this study was obtained from Institutional Ethical Committee before commencement of study. 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, BRD Medical College, Gorakhpur, Uttar Pradesh, between January 2020 to December 2020 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.

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.

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 dermatomyositis.

Aetiology of Hypertension

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%

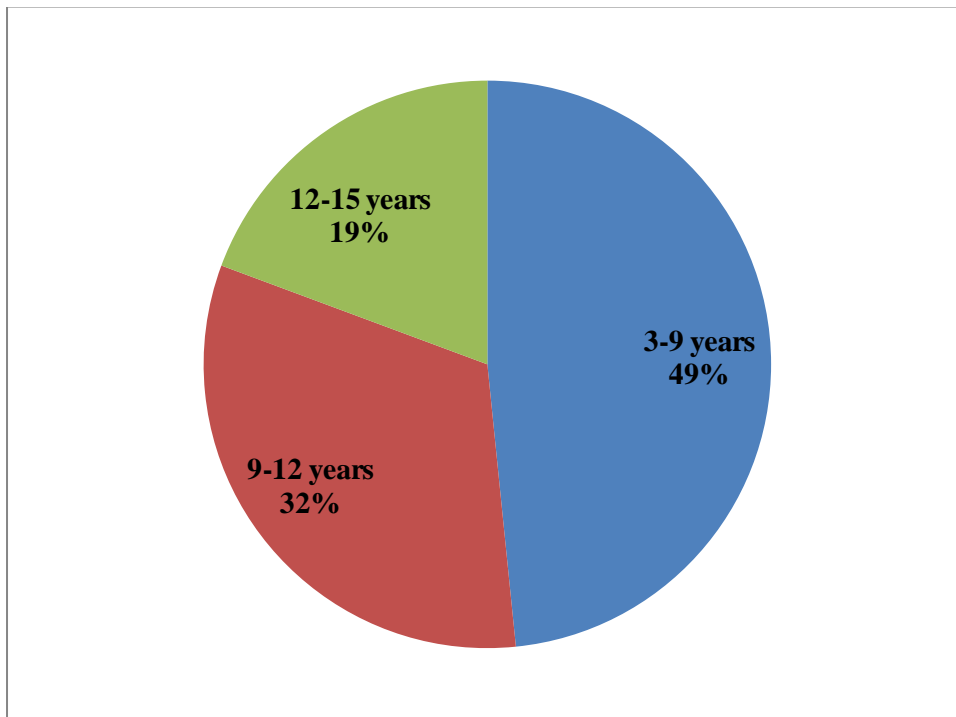


Fig 1: Age Distribution

Table 2: Gender Distribution

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

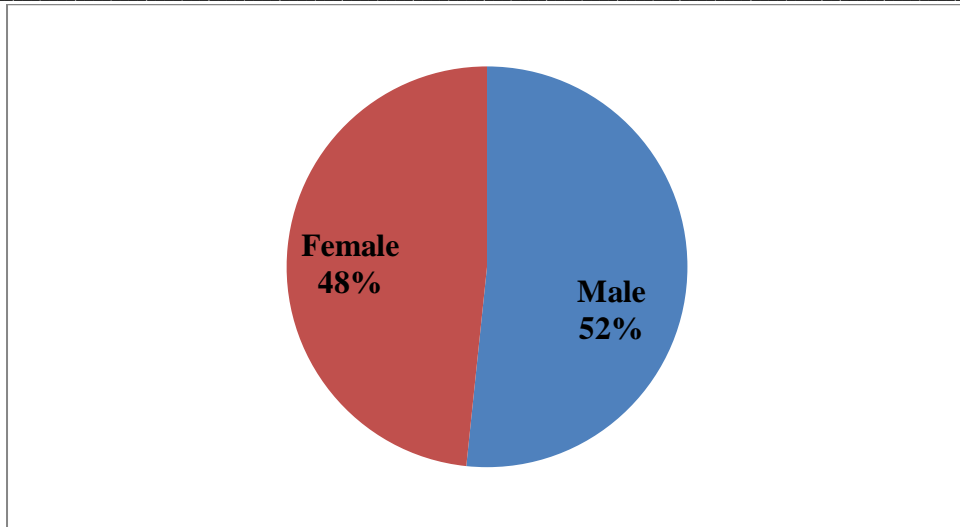


Fig 2: Gender Distribution

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%

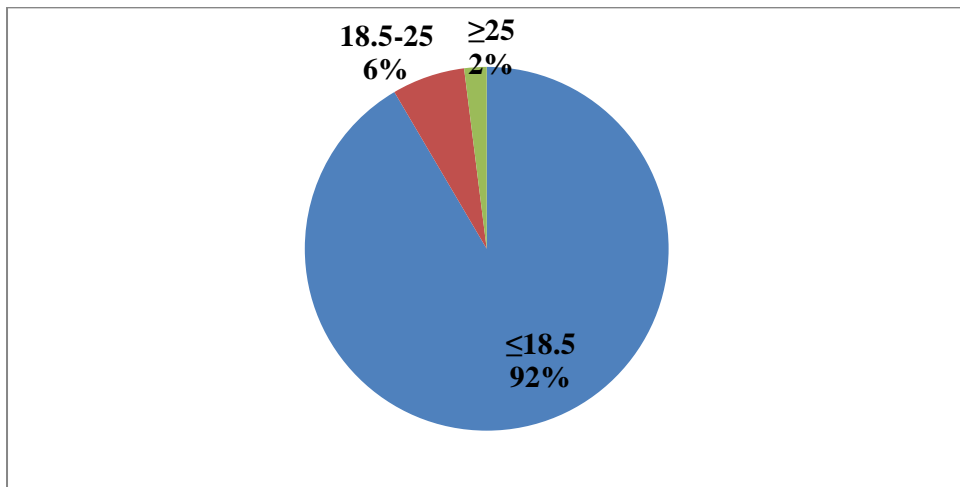


Fig 3: BMI Distribution

Table 4: Clinical Presentation

S.No	Clinical features	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%

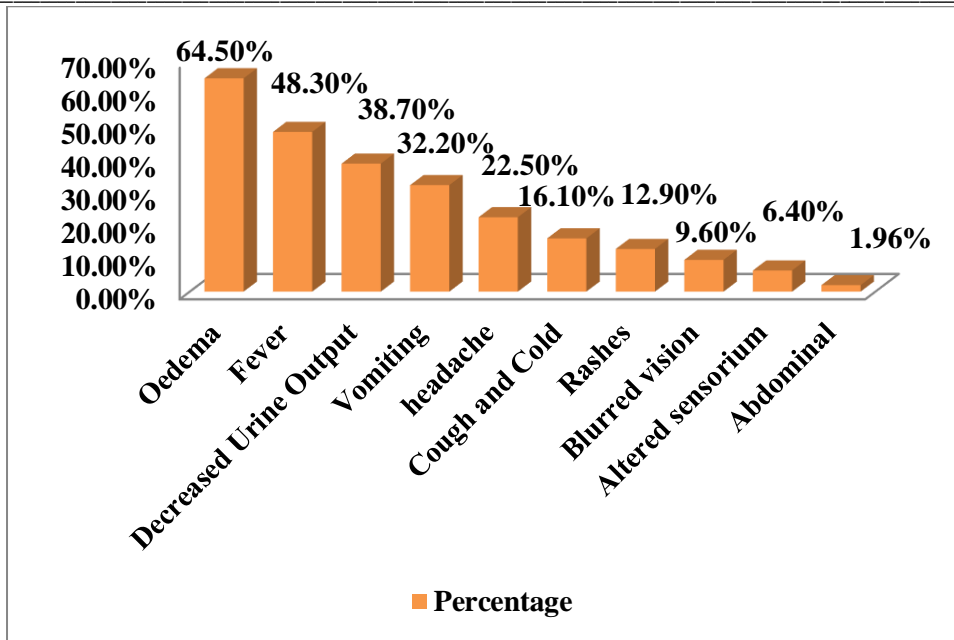


Fig 4: Clinical presentation

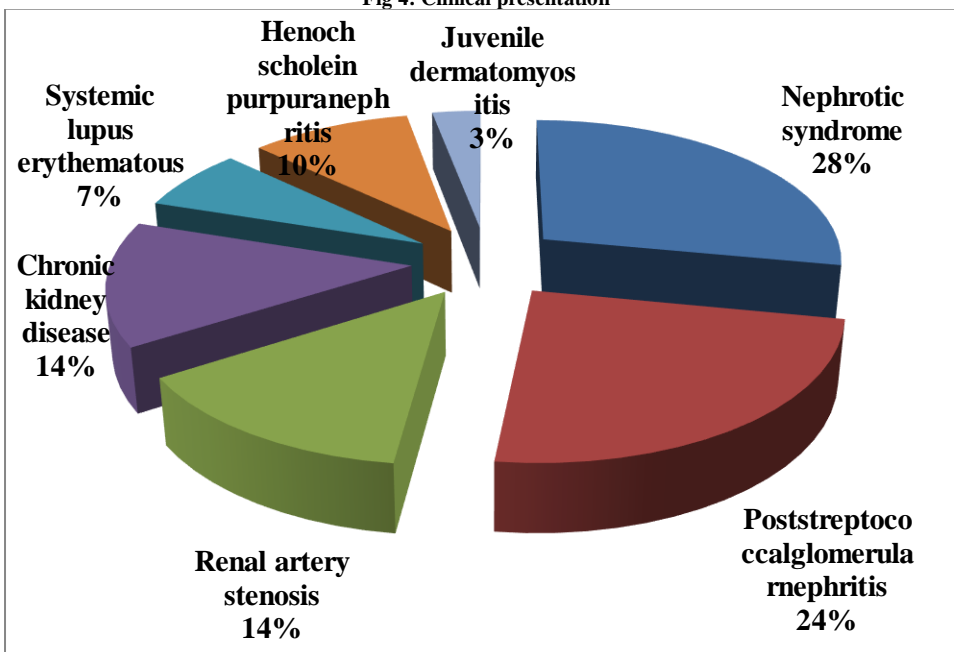


Fig 5: Distribution Based of Aetiology

Discussion

Verma et al, did a study in 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 Seurat 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].

Conflict of Interest: Nil

Source of support: Nil

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 underweight; there was no relation between increasing weight and hypertension.

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