



THE INCIDENCE OF ASYMPTOMATIC HYPERTENSION IN SCHOOL CHILDREN OF 5-10 YEARS OF AGE AND ITS CORRELATION WITH RENAL FUNCTION TEST.

Paediatrics

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ABSTRACT

Aim - To find out the incidence of asymptomatic hypertension in school children of 5-10 years of age and its correlation with renal function test.

KEYWORDS

INTRODUCTION

The blood pressure precisely means arterial blood pressure. The arterial pressure is conventionally written as systolic pressure over diastolic pressure e.g. 120/80 mm Hg¹.

The relevance of childhood BP measurement in paediatrics health care and development of adult essential hypertension has undergone substantial conceptual changes during the past two decades⁸. The incorporation of BP measurement into routine paediatrics examination as well as the publication of national norms for BP in children not only enable detection of significant asymptomatic hypertension secondary to a previously undetected disorder but also confirmed that mild elevation in BP during childhood were more common than previously recognized, particularly in adolescents. It is now understood that hypertension detected in some children may be a sign of an underlying disease, such as renal parenchymal disease, where as in other cases the elevated BP may represent the early onset of essential hypertension. Factors Influencing Blood Pressure In Childhood²⁰.

Blood pressure is considerably lower in children than adults but almost always increases steadily through out the first two decades of life. The average systolic blood pressure at one day of age of life (full-term infant) is approximately 70 mm of Hg and it is increased to approximately 85 mm of Hg by one month of age³.

A number of factors known to be associated with hypertension in adults have also been associated with higher levels of blood pressure in children and adolescents; A direct relation between weight and blood pressure has been documented as early as five years of age and is more prominent in the second decade. Height is independently related to blood pressure at all ages. Sex and rates do not have the same impact on blood pressure in children as in adults. No significant differences in blood pressure have been found in comparisons of white, blacks, Hispanic and Southeast Asians until adolescence. Blood pressure is slightly higher in boys than girls during the first decade of life⁵. This difference begins to widen around the onset of puberty, and blood pressure is significantly higher in young men by the end of the teenage years. The prevalence of hypertension in children is significantly less (1-3%)⁹. The majority of these children have only mild increase in blood pressure and are belonging to the category of primary (essential) hypertension. However, there is a small group of children with much higher blood pressure, most of whom suffer from secondary hypertension.

Hypertension is a major public health issue in industrialized nation, affecting approximately 20% adult. The close association of hypertension with atherosclerosis, coronary and cerebrovascular disease, diabetes and end stage renal disease makes it a major contributor to the most common causes of morbidity and mortality⁹.

I have designed this study to find out the incidence of asymptomatic hypertension/raised Blood pressure in school going children in Ranchi.

Method of measuring of bp in children with sphygmomanometer and cuff

Manometers in conventional use are the mercury-gravity. The mercury-gravity monometer has the advantages of widespread general usage, reliability, accuracy and not requiring recalibration. It's reservoir must be properly filled with mercury the out vent kept clean and the gas tube free of dust or oxidized particles. Besides this other instruments like aneroid monometer, Doppler or oscillometric technique (Dynamap) may be used for measurement of Bp¹⁵.

RESULTS-

This study is a randomly selected cross sectional analysis blood pressure of school going children between 5-10 years of age. Total 110 children were taken of which 53 (48%) were girls and 57 (52%) were boys (Table-1&2). Blood pressure was measured by mercury manometer on three separate occasions on 10 minutes interval in relaxed state. The mean systolic and diastolic blood pressures were taken for statistical calculation. The over all incidence of hypertension for systolic and diastolic are 4.95% and 3.61% respectively (Table -3). Age distribution and high blood pressure both stage I & stage II are shown in Table-1 & Table-2. Primary and secondary hypertension and etiological factors are shown in Table-3 and 4.

Table1

Age	No. of Observation	Sex	Systolic BP		Diastolic BP	
			95 th -99 th Percentile plus 5 mm of Hg	99 th Percentile Plus 5 mm of Hg	95 th -99 th Percentile Plus 5 mm of Hg	99 th Percentile Plus 5 mm of Hg
5 Yr	12	F	0	00	00	00
6 Yr	13	F	0	01	00	01
7 Yr	10	F	0	0	00	00
8 Yr	5	F	0	00	00	00
9 Yr	9	F	02	00	01	00
10 Yr	8	F	02	00	02	00
Total	57	F	4	01	3	01
Incidence		4.5%			3.6%	

Table 1 shows numbers of girls having systolic or diastolic blood pressure range 95th-99th Percentile plus 5 mm of Hg and 99th Percentile plus 5 mm of Hg. In my study I found 4 stage-I hypertension (4%) and 1 stage-II hypertension (1%) for systolic blood pressure and 3 stage-I hypertension (3%) and 1 stage-II hypertension (1%) for Diastolic blood pressure out of 57 girl children.

Table 2

Age	No. of Observation	Sex	Systolic BP		Diastolic BP	
			95 th -99 th Percentile plus 5 mm of Hg	99 th Percentile Plus 5 mm of Hg	95 th -99 th Percentile Plus 5 mm of Hg	99 th Percentile Plus 5 mm of Hg
5 Yr	13	M	00	00	0	00

6 Yr	12	M	00	01	0	00
7 Yr	6	M	00	00	0	00
8 Yr	5	M	00	00	02	00
9 Yr	9	M	02	00	01	00
10 Yr	8	M	03	00	01	00
Total	53	M	5	01	4	00
Incidence	5.4%		3.63%			

Table shows numbers of boys having systolic or diastolic blood pressure range 95th-99th Percentile plus 5 mm of Hg and 99th Percentile plus 5 mm of Hg. In my study I found 5 stage-I hypertension (4.54%) and 1 stage-II hypertension (0.9%) for systolic blood pressure and 4 stage-I hypertension (3.6%) and no stage-II hypertension for Diastolic blood pressure out of 53 boy children.

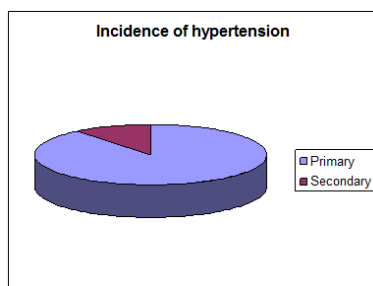
Table-3

INCIDENCE OF HYPERTENSION
Systolic: 4.95%
Diastolic: 3.61%

The above table shows the incidences of raised Systolic and Diastolic Blood Pressure

Table 4

INCIDENCE OF HYPERTENSION
No. of Primary hypertension: 8 (7.2%)
No. of Secondary hypertension: 2(1.8%)

**Fig.1**

The over all incidence of primary and secondary hypertension are 7.2% and 1.8% out of total 110 observation. This is also depicted in Pie diagram.

Table 5

Cause	Number
Renal	08 (80%)
Endocrine	02(20%)
Co-arc-tation of aorta	00

The above table shows the causes of Secondary hypertension.

Age	Sex	Mean SBP	Mean DBP	Mean urea	Mean creat
5 Yr	F	93.16	63.33	20.9	0.57
6 Yr	F	100.97	71.56	24.38	0.63
7 Yr	F	106.63	69.07	24.35	0.64
8 Yr	F	108.93	69.76	24	0.62
9 Yr	F	108.17	68.6	28.78	0.58
10 Yr	F	108.64	69.42	27.25	0.65

Fig.2 The above table shows mean Systolic and Diastolic blood pressure ,blood urea and creatinine distribution in girls.

Age	Sex	Mean SBP	Mean DBP	Mean urea	Mean creat.
5 Yr	M	99.79	67.28	22.38	0.58
6 Yr	M	104.35	68.75	25.04	0.62
7 Yr	M	108.01	69.16	21.33	0.73
8 Yr	M	112.01	78	25.05	0.58
9 Yr	M	108.53	69.49	28.78	0.68
10 Yr	M	108.04	68.4	27.63	0.73

The above table shows mean Systolic and Diastolic blood pressure distribution in boys.

SUMMARY AND CONCLUSION

The incorporation of B.P. measurements into routine paediatrics examination as well as the publication of nation mums for B.P. in

children not only enable detection if significant asymptomatic hypertension secondary to a previously undetected disorder but also confirmed that mild elevation in BP during childhood were more common than previously recognized particularly in adolescents.

Hypertension is a major public health issue in industrialized nation, affecting approximately 20% of adult. The close association of hypertension with atherosclerosis, coronary and cerebrovascular disease, diabetes and end stage renal disease makes to a major contributor to the common causes of morbidity and mortality. So it is clear that hypertension detected in some children may be a sign of an underlying disease, such as renal parenchymal disease, where as in other cases the elevated BP may represent the early onset of essential hypertension.

Therefore blood pressure should be measured routinely in all paediatric examination including in office practice & monogram should be available to every doctor to classify a case of hypertension or normotension according to age, sex and height. Routine blood pressure measurement should also be incorporated in school health programme. Hypertensive child should be thoroughly investigated and be treated accordingly in order to prevent further hypertension and related morbidity and mortality.

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