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ASSESSMENT OF BLOOD PRESSURE AMONG SCHOOL GOING CHILDREN OF AGE GROUP 6 – 14 YEARS IN URBAN AREA - CHIDAMBARAM

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ABSTRACT

Though hypertension is a problem of adults, its etiology process starts in childhood itself. To study the distribution of blood pressure among school going children and to find out the correlation between selected risk factors with raise in blood pressure among school going children of age group 6 – 14 years. A descriptive study was conducted among school going children of age group 6-14 years from three schools of Chidambaram . Convenient sampling was used to select the schools. 17.75% of children were found to have raised blood pressure. A positive correlation was found between raised blood pressure and TV viewing habits. Early diagnosis of hypertension is necessary to initiate preventive measures.

Key words: Blood pressure, School going children, Risk factors.

INTRODUCTION

Hypertension has its origin in childhood but goes undetected unless specially looked for this period. With globalization bringing more life style modifications, school going children and adolescents are exposed to multiple risk factors including obesity [1].

Early diagnosis of hypertension is necessary to initiate preventive measures but this seems difficult due to the lack of symptoms. Even though, it is proved that even asymptomatic adolescents with high blood pressure (BP) elevation can have evidence of target organ damage. The factors known to affect BP among children including age , sex, body size, race/ ethnicity , obesity and socio-economic status. Reference norms developed for one particular population may not be applicable to other. Currently the fourth report from the national high BP education program working group on children and adolescents provide updated recommendations for diagnosis, evaluation and treatment of hypertension. The new tables based on normative distribution of BP in healthy children includes 50th and 99th percentiles of BP values along with earlier 90th and 95th percentile values [2].

The present study was conducted to study the distribution of blood pressure among the children and to

find out the correlation between selected risk factors with raise in blood pressure among children in the age group 6 – 14 years.

METHODOLOGY

This cross sectional study was carried out in three schools at Chidambaram, cuddalore district, Tamilnadu .The schools are Nandhanar boys higher secondary school, Sri gurugnana sambandhar matriculation higher secondary school and Nandhanar girls higher secondary school . These schools were selected by convenient sampling as the investigator was able to get permission from these schools. Undergraduate medical students were involved in this study for collection of data. 400 children of age group 6-14 years were selected from second standard to eighth standard. All students who were present on the day of examination were included in the study.

Socio-demographic details such as age, sex, socio-economic status , height, weight, blood pressure, type of physical activity, TV viewing habits and family history of hypertension were collected using a pre tested proforma. The children were asked to get the family history of hypertension from their parents and collected the report

(yes/no for mother, father & both) next day. Weight of the children was recorded using a bathroom weighing machine. Height was calculated using a measuring chart. BMI was calculated using the formula weight (kgs)/height(m.sq). Blood pressure was measured in right upper limb with the children in sitting posture. Statistical methods like percentages and test of significance like Chi square test were used for statistical analysis.

RESULTS & DISCUSSION

Out of 400 children examined, 52.5% were boys and 47.5% girls. Majority of the study subjects are in the age group of 13 years (47.2%) [table 1] Regarding parent's occupation, majority of the fathers (54%) had salaried jobs whereas mothers were homemakers(49%). Majority 43% studied upto secondary education. 82.25% children had normal blood pressure and the remaining 17.75% (71 out of 400) had raised blood pressure., ie the prevalence of raised BP is higher by 17.75%.

Raised systolic blood pressure alone was found to be 2% and raised diastolic blood pressure alone was found to be 9% [Fig 1].

Early identification of hypertension and pre-hypertension translates into early intervention and possibly prevention of later morbidity and mortality [3]. In the present study, the prevalence of hypertension was found to be 17.75% .similar findings were observed by Manu raj et al and Jasmine s. sundar *et al* 17.34% and 21.5% respectively [1,4]. In contrast to this, various studies showed a low prevalence of 3%, 2.56% and 2.8% [5, 6]. In the present study, the prevalence of high systolic BP was found to be 2% and diastolic BP was found to be 9%. A study done by supreet kaur among school children in the age group of 5-16 years belonging to lower income group showed 3.8% high systolic BP and 4.4% high diastolic BP which showed significant association with BMI and waist circumference. Compared to girls, boys had raised blood pressure [Table 2]. Compared to girls, boys had raised blood pressure (20.9% and 14.2%).This difference was not statistically significant according to our study. Savitha *et al.* showed no sex predilection among boys and girls [7]. Jasmine S Sundar *et al* observed higher prevalence among boys (31.75%) than girls(10.05%) [1]. Similar results were observed in kerala in 2007.

A positive correlation was found between raised blood pressure and TV viewing habits [Table no 3]. BP increases as duration of watching TV increases.

A positive correlation of raised BP and TV viewing habits was observed in this study which is consistent with study done by Perrie EP *et.al* which showed children watching 2- 4 hours of tv had 2.5 times the odds of having hypertension and children watching 4 or more hours of TV were 3.3 times greater than for children watching 0 to < 2hours of TV [8].

No significant correlation of SBP and DBP with BMI was observed in the study [table 4] which is consistent with the previously reported studies on BP in children

A study done by Saran *et al.* could find out correlation of BP with body weight only. The study of childhood hypertension is of paramount importance as BP in childhood is the best predictor of hypertension in later life supported by phenomenon of "tracking". Studies have documented target organ damage among asymptomatic hypertensive hence healthy behavioural changes among pre-hypertensive's and early diagnosis and treatment can reduce long term morbidity and eventual mortality in later life. The current study showed no association between physical activity and raised BP [Table 5]

But spending more time in physical activities plays an important role in preventing and delaying the onset of hypertension. The association between physical activity and hypertension is an established fact. A study done by Gang proved the protective effect of physical activity in both sexes regardless of the level of obesity. Jasmine S Sundar *et al* could not find any significant association between physical activity and hypertension. In depth analysis of the level of physical activity of the students only reveal the association in a better way.

No significant correlation was found between raised blood pressure and family history of hypertension [Table 6].Prevalence of hypertension was high among children of hypertensive parents (either father, mother or both) which was proved by several studies (Jasmine s sundar *et al*, Sharma *et al*, K A Jameson *et al* in US).The present study couldn't reveal any co-relation between raised BP and history of hypertension among parents. The reason might be the investigator assessed this variable as reported by the children without verifying.

Fig 1. Frequency distribution of BP
FREQUENCY DISTRIBUTION OF BP

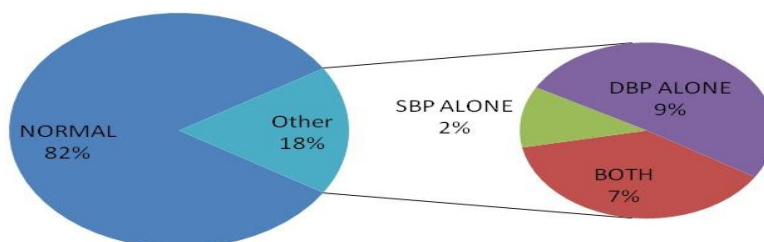


Table 1. Age Wise Distribution of Study Subjects

Age group	Boys		Girls		Total	
	No	%	No	%	No	%
6	8	3.8	7	3.6	15	3.7
7	15	7.2	20	10.4	35	8.7
8	23	11	15	7.8	38	9.5
9	24	11.5	25	13	49	12.2
10	21	10	26	13.5	47	11.7
11	28	13.4	28	15.1	56	14
12	30	14.4	31	16.1	61	15.2
13	49	23.5	36	18.7	85	21.2
14	10	4.8	4	2	14	3.5
Total	208	100	192	100	400	100

Table 2. Sex wise distribution of blood pressure

Gender	Raised BP No (%)	Normal BP No (%)	Total No (%)
Boys	44 (20.9)	166 (79.0)	210 (52.5)
Girls	27 (14.2)	163 (85.7)	190 (47.5)
Total	71 (17.7)	329 (82.2)	400 (100)

{Chi square test = 0.916; P Value = 0.338}

Table 3. Distribution of blood pressure according to tv viewing habits

Duration	Raised BP No (%)	Normal BP No (%)	Total No (%)
Nil	5 (11.6)	38 (88.3)	43 (10.7)
<1 hour	36 (16.5)	186 (85.3)	222 (55.5)
1-2 hours	19 (20.6)	76 (82.6)	95 (23.7)
>2 hours	11 (29.7)	29 (78.3)	40 (10)
Total	71 (17.7)	329 (82.2)	400 (100)

{ Chi square test = 5.079 ; P Value = 0.024}

Table 4. Distribution of blood pressure according to body mass index (BMI)

Body Mass Index (BMI)	Raised BP No (%)	Normal BP No (%)	Total No (%)
Underweight	17 (15.5)	92(84.4)	109 (27.2)
Normal	47 (17.3)	224(82.6)	271 (67.7)
Overweight & Obese	7 (35)	13(65)	20 (5)
Total	71 (17.7)	329 (82.2)	400 (100)

{Chi square test = 4.453; P Value = 0.108}

Table 5. Distribution of blood pressure according to their physical activity

Duration	Raised BP No (%)	Normal BP No (%)	Total No (%)
Nil	6 (18.1)	27 (81.8)	33 (8.2)
< 1 hour	24 (22.6)	82 (77.3)	106 (26.5)
1-2 hours	25 (15.9)	132 (84.0)	157 (39.2)
>2 hours	16 (15.3)	88 (84.6)	104 (26)
TOTAL	71 (17.7)	329 (82.2)	400 (100)

{Chi square test = 1.30; P Value = 0.254}

Table 6. Distribution of blood pressure according to family history of hypertension

Family	Raised BP No (%)	Normal BP No (%)	Total No (%)
Nil	59 (18.3)	263 (81.6)	322 (80.5)
Father	8 (16.6)	40 (83.3)	48 (12)
Mother	3 (13.0)	20 (86.9)	23 (5.75)
Both	1 (14.2)	6 (85.7)	7 (1.75)
Total	71 (17.7)	329 (82.2)	400 (100)

{Chi square test = 0.378; P Value = 0.828}

CONCLUSION

Tracking of blood pressure is done in school going children, early identification of hypertension and intervention is possible which will ultimately prevent the later complications.

LIMITATIONS

BP measurement was taken only once; The predictive power of a single measurement during a single visit is small. Inter-observer bias must have influenced the study.

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