ORIGINAL RESEARCH PAPER

Volume-7 | Issue-5 | May-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A PROSPECTIVE STUDY OF BLOOD PRESSURE IN SCHOOL CHILDREN OF BARPETA DISTRICT OF ASSAM

Physiology

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ABSTRACT

Introduction and Objectives – It is well established that hypertension is a major public health burden. It is multifactorial in origin including the genetic factors which predispose the children as well as children of hypertensive persons to higher blood pressures levels at a younger age. More so, increase of blood pressure may be a health concern in the later stages of life.

This study which is a prospective one and was carried to find out the profile of blood pressure in school children of the district of Barpeta, Assam. My aim was to see and to do a baseline screening of the pattern of blood pressure distribution and thereby the prevalence of hypertension and its correlation with age and sex of the children as well as to bring to the limelight that these children who are dwelling in the remotest districts of our country get proper access to medical diagnosis and other benefits. I, hope to carry out this study further and to obtain more of epidemiological information.

Materials and Methods – The current study is a cross sectional study, conducted in the schools located around Fakhruddin Ali Ahmed Medical college and Hospital, Barpeta, Assam. A total of 300 school children of 6-15 years of age are taken into account in respect of their age and sex.The results were calculated statistically. The study was carried in January 2018 to March 2018.

Result – Systolic blood pressure and Diastolic blood pressure have a positive correlation with age and sex of the children. A rising trend was seen with increase of age in both the sexes.

Conclusion – The prevalence of the rising trend of mean SBP and DBP was observed in school going children which is of concern for the medical fraternity, family and the society at large. This study has bought into focus that there exists certain sections of the society who needs care and follow up. The other parameters related to the rise of blood pressure should be looked into and corrected from further consequences. The results obtained were statistically significant at p 0.05.

KEYWORDS

Hypertension, Blood pressure, Children

1. Introduction

Blood pressure studies provide important epidemiological information which may help in controlling, modifying and thereby the allay of the coronary risk factors[1,2]. The necessity for routine blood pressure screening in children was almost absent in recent past, the main reason against it being that there exist a belief system that essential hypertension is an adult disease and there is no evidence that screening healthy children bears a result [3]. An increasing number of healthy children across the world are being diagnosed with hypertension [4]. Primary hypertension is seen more often in obese patients, with low physical activity, increased intake of high calories, high sodium and low potassium foods, use of caffeinated and alcohol beverages, mental stress and sleep deprivation which has become rampant in our society today. High intake of meat products in the families show a comparatively increase in blood pressure. The children of the study belong to the families who were chronic meat eaters and almost the major meals of the day are non-veg (red meat) for about three to four days in a week; and this goes on. Children with hypertension should also be screened for other risk factors for cardiovascular disease, including diabetes mellitus, hyperlipidaemias and renal damage. The American Academy of Paediatrics recommends routine screening of asymptomatic children during preventive care visits or a routine has to be maintained for primary checking of blood pressure in the schools [5].Blood pressure is not routinely measured or is uncertain in the peripheral hospital but through this study I, tried to reach to the children residing in the remote areas of Barpeta district. They are also unlikely to attend preventive care visits and therefore miss opportunities to have a baseline blood pressure screening. There are limited reports on blood pressures of the school going children in this region of the country. Since they form a sizeable proportion of the population, measurement of blood pressure in healthy school children, especially during routine medical examination at school entry or thereafter, present an opportunity for baseline screening of blood pressure for the paediatric population through the school health programmes.

2. Materials and Methods

The schools are randomly selected around Fakhruddin Ali Ahmed Medical College, Barpeta, Assam, India where boys and girls of 6 years to 15 years are examined. Permission and consent are taken from the concerned authorities before conducting the examination. The parents of the children are also called to take the family history and the respective community status. Random sampling is done and a total of 300 children were examined. The age is determined from the birth certificate submitted by the parents to the school authority which was recorded in the school register.

Blood pressure and few associated data were collected were collected from history taking both from the parents as well as from the children. The height of the children were measured and recorded.

Blood pressure is measured using the standardized sphygmomanometer with appropriate size cuff covering two thirds of the arm circumference. The blood pressure is measured in a child at the sitting position, with the arm kept at the level of the heart. Each and every child is made comfortable before the examination to avoid false positive results [6]. If the systolic pressure and the diastolic pressure or either of the two parameters were in the higher range than two additional readings were obtained at an interval of 1 to 2 weeks. The lowest of these readings were recorded. In the study to identify blood pressure percentiles, the first step is to consider the height percentile table and then to see which percentile of height the child has. Then the reference is again made with the values in blood pressure percentile corresponding to the age, sex and height percentile. Actual blood pressure percentiles assume clinical significance in the diagnosis, classification and the treatment of hypertension in children.

Systolic and the diastolic blood pressure equal to 95th percentile for gender, age and height for three or more occasions is defined as hypertension in children. Pre-hypertension is defined as systolic blood pressure or the diastolic blood pressure that are equal to 90th percentile but less than 95th percentile. Stage 1 hypertension refers to hypertension from 95th percentile to 99th percentile Stage 2 hypertension refers to values above stage 1 hypertension. The 50th percentile of blood pressure is the stage where drug therapy is indicated [7].

3. Result and Discussion

In the study, 300 students of 6 years to 15 years of age from different schools were included, among which 150 were boys and 150 were girls. This is a screening to see for the presence of the rising trend of blood pressure and hypertension amongst the children who too belong to different communities. From Table 1, it can be shown that the mean SBP of boys shows a rising trend of blood pressure. 126.90 mmHg to 134.46 mmHg is seen between 6 to 15 years of age. In between, 6 years to 9 years there is a difference in the rise of mean SBP but from 10 years to 15 years there is a gradual rise in blood pressure. This could be attributed to 6 years to 9 years there is a difference in the rise of mean

SBP but from 10 years to 15 years there is a gradual rise in blood pressure. This could be attributed to the increase in body mass of these children. The rise is found to be significant (p = 0.00882).More or less the same trend is seen for girls of the same age group which is obvious from Table 2. In girls, it is seen that there is a gradual rise of SBP from 6 years to 9 years. After 9 years there is a near abrupt rise followed by a gradual rise in mean SBP till 15 years of age. The rising trend is found to be significant (p = 0.005989). From Table 3, it can be seen that there is a gradual rise of mean DBP of boys from 6 years to 13 years. But in the last age group that is from 14 years to 15 years the rise seems to be near abrupt. However, this rise was found to be significant (p = 0.000033). From Table 4, the mean DBP of girls from 6 years to 15 years shows a little bit of undulating trend. But here too a near abrupt rise of mean DBP is seen from 12 years to 15 years from 93.30mmHg to 96.20mmHg. However this gradual rise was found to be significant (p = 0.000284).

In the study, the increase or rise in the trend of both the SBP and the DBP might be due to life style and diet modifications [7, 8, 9, 10].

Children who shows an increase in the trend of rise in blood pressure develops obvious and sometimes fulminating hypertension when they grow up [11, 12].Population based epidemiological studies shows that primary hypertension is far more common among apparently healthy children. Although the prevalence of hypertension is far less in children than in adults, there is enough evidence to suggest that the root of essential hypertension extends into childhood [13, 14]. But due to lack of compliance from the part of the children as well as their parents despite adequate motivation further screening was not possible. But the data collected from the remotest schools of the Barpeta district is enough to be known to the medical fraternity that there exist certain areas in the society where the rising trend of blood pressure might prove to have a serious burden in the society. Since this is a prospective study, the aim is to continue it further because hypertension is a major risk factor for cardiovascular and cerebrovascular diseases .Another important aspect of this study is that it can be a part of other population based epidemiological studies. The gradual or the near abrupt rise of both mean SBP and DBP is more in the adolescent years in both boys and girls which needs more of comprehensive care.

Table 1. Mean and Standard deviation of Systolic blood pressure (SBP) of boys according to age.

Age in years	Mean SBP(mmHg)	S.D.	p - value	Significance at p < 0.05
6 – 7	126.90	8.58	0.00882	Significant
8 -9	130.63	7.55		
10 – 11	132.13	9.59		
12 - 13	133.33	9.40		
14 - 15	134.46	7.42		
Total - 150				

Table 2 – Mean and Standard deviation of Systolic blood pressure (SBP) of girls according to age

Age in yrs.	Mean SBP(mmHg)	S.D.	p - value	Significance at p < 0.05
6 - 7	125.73	20.90	0.005989	Significant
8 - 9	126.67	6.91		
10 - 11	133.20	4.32		
12 - 13	132.73	4.02		
14 - 15	132.60	3.68		
Total 150				

Table 3 – Mean and Standard deviation of Diastolic blood pressure (DBP) of same boys according to age.

Age in yrs.	Mean DBP(mmHg)	S.D.	p - value	Significance at p < 0.05
6 – 7	90.93	5.14	0.000033	Significant
8 - 9	92.80	4.54		
10 - 11	93.00	4.98		
12 - 13	93.60	3.84		
14 - 15	96.20	3.34		

Table 4 – Mean and Standard deviation of Diastolic blood pressure (DBP) of same girls according to age.

Age in yrs.	Mean DBP(mmHg)	S.D.	p - value	Significance at p < 0.05
6 -7	94.27	3.01	0.000284	Significant
8 - 9	93.53	3.05		
10 - 11	92.93	2.91		
12 - 13	93.40	3.02		
14 - 15	96.30	3.25		

4. Summary and Conclusion

The prevalence of the rising trend of blood pressure in school going children of 6 years to 15 years of age is significant. All the children having high blood pressure were in pre hypertension stage. None had isolated high systolic blood pressure or high diastolic blood pressure. Routine blood pressure monitoring in school children should be encouraged, starting at school entry to serve as a baseline screening, assessment and follow up which is to be done whenever necessary. Large multicentre epidemiological surveys which are being carried on with a uniform protocol has to draw the attention in our districts to develop ways and means to treat our children and to develop our own ranges of normal blood pressure values for children. This prospective study, which is a maiden one, can be carried forward to the ethnic communities for in length detection of high blood pressure and associated risks to reduce the burden of the family, society and the country at large. Children of the adolescent age group should be taken care of by initiation of counselling, recreation and medical treatment if required. This study, in this region has bought forward that the paediatric population needs to taken care of and has to be a part of other large scale studies.

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