

Original Research Article

# Community based Study on distribution of Blood Pressure and its correlates among School Going Children of Nalanda District


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## Abstract

Hypertension is major risk factor for many illnesses. Studies have shown that burden of hypertension in children is increasing. Hence, this study was conducted to find distribution of blood pressure and correlates among School Going Children of Nalanda District. Mean SBP was  $107.1 \pm 7.8$  mm of Hg and mean DBP was  $71.0 \pm 4.4$  mm of Hg. It was seen that mean SBP and DBP were higher for males as compared to females ( $p=0.00$ ) and higher age ( $p<0.05$ ) and not related to religion ( $p>0.05$ ) and socioeconomic status ( $p>0.05$ ). Routine BP measurement in children is vital.

## Key words

Blood Pressure, School going, Children, Nalanda, Bihar.

## Introduction

Hypertension has been identified as risk factor for many of the chronic diseases and has its foundation in the early stages of life [1]. Studies indicate that minor increase in BP in early stages is associated with increased risk in later life [2].

Different studies have been conducted in various parts of India which demonstrated that there are increased burden of hypertension in children [3, 4]. Study has not been conducted in this part. Hence, this study was conducted to fill the gap.

## **Aims and objectives**

The present study was done to find the distribution of Blood Pressure and its correlates among School Going Children of Nalanda District of Bihar.

## **Materials and methods**

The present study was community based descriptive in nature conducted in selected schools between May – July 2015.

Study subjects included apparently healthy children between 6 to 16 years of age studying in the selected schools. Students absent on the day of data collection and those refusing to participate were excluded.

The schools were visited and administrative authorities were taken into confidence. Data collection was done on a date fixed by the authorities. Orientation of students was done regarding importance of this study and they were encouraged to participate. Consent was taken from school administration and children were informed before data collection. The data collection was done by personal interview using semi-structured pre-tested questions containing open and closed ended questions. Clinical examination of children was done focusing mainly on blood pressure measurement. Mercury sphygmomanometer was used for measurement of BP in supine position. The cuff bladder of sufficient width was used which should cover at least 2/3<sup>rd</sup> of arm and long enough to encircle arm completely. The first and fifth Korotkoff's sounds were considered for the SBP and DBP respectively. Three times recording of BP was done with five minutes interval between each measurement. Detailed information was collected regarding socio-demographic profile of children and clinical findings including blood pressure. This was followed by health education session for children.

The data was coded and entered in Microsoft Excel 2007, cleaned and analyzed by using SPSS version 16.0. Categorical variables were

summarized as percentage while continuous variables were presented as Mean  $\pm$  SD.

## **Results and Discussion**

The present study was conducted among 734 children in the age group of 6-16 years studying in the selected schools.

48.8% of the children were males. Average age of children was 11.0 years. 81.5% children belonged to Hindu religion and 49.5% were from socioeconomic class V as per **Table - 1**.

Mean SBP was 107.1 $\pm$ 7.8 mm of Hg and mean DBP was 71.0 $\pm$ 4.4 mm of Hg. It was seen that mean SBP and DBP were higher for males as compared to females and the difference was significant ( $p=0.00$ ). Both the mean SBP and mean DBP increased across the years and the difference was significant ( $p<0.05$ ). The association of both mean SBP and mean DBP with religion ( $p>0.05$ ) and socioeconomic status ( $p>0.05$ ) were not significant as per **Table - 2**, **Figure - 1**.

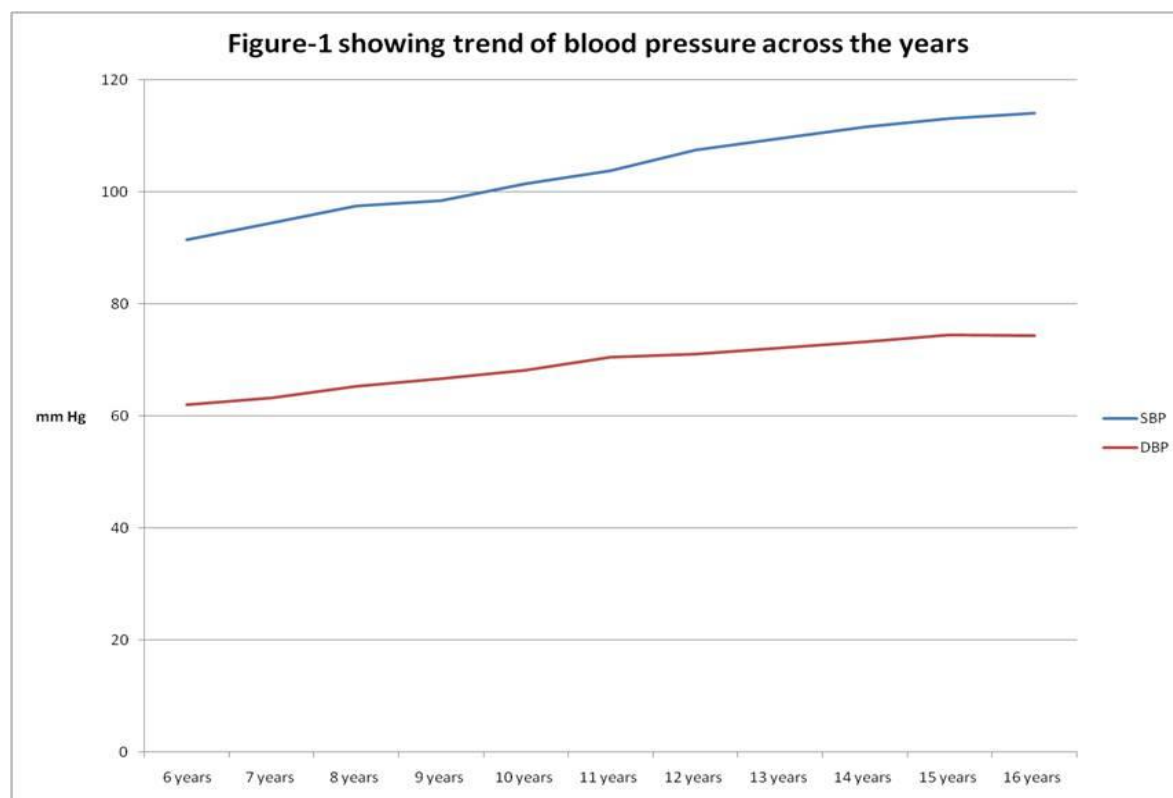
Similar findings have been observed by Sayeemuddin, et al. [5], Sharma, et al. [6] and Agrawal, et al. [7] who observed that there is positive correlation between age and blood pressure. It is observed that SBP increased at a faster rate as compared to DBP along with age. Higher BP has been observed in males which are similar to the finding of Maggio, et al. [8]. Taksande, et al. [9] also observed that in boys, SBP and DBP increased with age except a marginal decline in SBP at the age of 17 years (-0.09) and decrease in the DBP (-1.29) at 16 years of age. In girls, SBP and DBP also increased with age except at 11 years, where in there was a mild decrease in SBP (-0.09) as well as the DBP (-0.24). Borah, et al. [10] found that girls had significantly higher ( $P<0.001$ ) mean systolic blood pressure than boys. Both SBP and diastolic blood pressure (DBP) revealed significant correlation with age, height, weight and BMI in overall and in gender specific analysis.

**Table - 1 showing the socio-demographic profile of children studied**

Variable	Groups	No.	%
Sex	Male	358	48.8
	Female	376	51.2
Age (in years)	6	67	9.1
	7	67	9.1
	8	68	9.3
	9	67	9.1
	10	62	8.4
	11	69	9.4
	12	65	8.9
	13	68	9.3
	14	69	9.4
	15	65	8.9
	16	67	9.1
Religion	Hindu	598	81.5
	Muslim	136	18.5
Socio-economical status	I	43	5.9
	II	87	11.9
	III	137	18.7
	IV	103	14.0
	V	364	49.5

**Table - 2 showing distribution of blood pressure**

Variable	Groups	Mean SBP	Mean DBP	Significance
Sex	Male	117.8±8.1	76.2±4.7	For SBP, t = 36.75, p=0.00 For DBP, t = 32.1, p=0.00
	Female	96.9±7.3	66.1±3.8	
Age (in years)	6	91.79±4.99	62.73±3.44	P<0.05
	7	94.67±7.13	63.56±3.32	
	8	97.98±7.94	65.11±3.98	
	9	98.14±7.72	66.98±5.17	
	10	99.80±7.41	68.47±5.57	
	11	103.83±11.29	70.91±8.36	
	12	107.96±12.33	71.58±8.40	
	13	109.19±11.45	72.43±8.79	
	14	111.37±11.65	73.46±9.45	
	15	113.10±11.71	74.25±8.11	
	16	114.38±11.76	74.64±9.30	
Religion	Hindu	107.1±6.8	71.2±4.6	For SBP, t = 0.31, p=0.76 For DBP, t = 1.87, p=0.06
	Muslim	106.9±7.3	70.4±4.1	
SES	I	108.5±7.1	72.3±4.5	p>0.05
	II	107.4±7.3	71.6±4.3	
	III	107.3±6.3	71.1±4.0	
	IV	107.1±7.8	71.1±4.1	
	V	106.8±7.1	70.8±4.1	



In the pooled study for age and sex specific mean values of 129 surveys worldwide, it was seen that BP level showed universal overall upward progression between ages 6 and 18 years, separately for systolic and diastolic blood pressure [11]. As per WHO technical report series on blood pressure in children, the average annual increase in SBP from birth until age of 20 is about 2 mm Hg in boys and about 1mm Hg in girls. Between ages 10-14 years, however the average rise is greater for both diastolic and systolic blood pressure, however there is no major difference between boys and girls [12].

### Conclusion

The findings of the present study are in line with other studies. SBP and DBP increased differently in males and females and among the different age groups. It is necessary to measure the BP regularly in children.

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