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Risk Factors of Hypertension among School Going Children in Rural Areas of Bangladesh

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Abstract **Original Research Article**

Introduction: Hypertension means high blood pressure. Despite general belief hypertension is a disease of adulthood, children and adolescents can also suffer from the condition and may remain unnoticed because of lack of routine measurement of blood pressure. From this study we have tried to find out the risk factors of hypertension among school going children in rural area. ***Aim of the study:*** The aim of this study was to evaluate the risk factors of hypertension among school going children in rural area. ***Methods:*** This was an observational study which was conducted in Paragon Hospital and Trauma Centre, Nababgonj, Dhaka, Bangladesh during the period from July 2018 to December 2018. One thousand, eight hundred and fifty (1850) children were visited OPD in study period. Among them 47 children with hypertension were selected for the study maintain inclusion criteria's, which represent 2.54% of the total children. The approval of the ethical committee of respective hospital and the proper written consent from all the participants were obtained before starting the intervention. A predesigned questioner had been used for collecting necessary data from the participants. For analyzing data we used Microsoft excel and SPSS. ***Result:*** In total 47 patients observing the primary symptoms of hypertension and try to find out most hypertensive factors for which the school going children in between the age of 6-14 years. The risk factors were as age, family history of hypertension, overweight, obesity, Age group 12 -14 years, additional salt and junk food intake plays a vital role in development of hypertension in school going children in rural area. ***Conclusion:*** Knowledge about risk factors, early and appropriate diagnosis is important since even a small decrease in blood pressure can have substantial effect on hypertension. So, BP should be measured routinely for all children during physical examination. Further cause and to prevent complications of hypertension.

Keywords: Hypertension, School going children, Risk factors.

INTRODUCTION

Hypertension means abnormally high blood pressure and especially arterial blood pressure or the systemic condition accompanying high blood pressure. It is serious since it can lead to heart attacks and strokes. According to medical definition hypertension is actually, abnormally high arterial blood pressure that is usually indicated by an adult systolic blood pressure of 140 mm Hg or greater or a diastolic blood pressure of 90 mm Hg or greater, also define as a renal or endocrine disorder, that typically results in a thickening and inelasticity of arterial walls and hypertrophy of the left heart ventricle, and that is a risk factor for various pathological conditions or events (as heart attack, heart failure, stroke, end-stage renal disease, or retinal haemorrhage). Again, a systemic condition resulting from hypertension that is either symptomless or is accompanied especially by dizziness, palpitations, fainting, or headache. Blood pressure (BP) measurement is a part of routine examination in adult population. It is generally believed that hypertension is a disease of adulthood and children are exempted. Moreover, BP measurement in infants and children is difficult and time consuming. So, in pediatric practice BP is not measured routinely and is assumed to be normal. Contrary to this belief it is estimated that 1-3% children are hypertensive [1]. Diagnosis of hypertension in adult is made when BP exceeds a defined level i.e. systolic BP (SBP) 140 mmHg and diastolic BP (DBP) 90 mmHg [2]. Absence of such single cut off value in children makes diagnosis of hypertension more difficult, and the use of such age - sex-independent absolute value is inappropriate. In

children or school going children, hypertension is diagnosed when resting BP consistently exceeds 95th centile in relation to age and sex [3]. In infancy and early childhood, hypertension is mainly secondary to some diseased conditions. In late childhood and adolescence, it is mainly primary or essential in type, not associated with any disease; but there appears to be a strong family history of hypertension. However, it is recognized that many factors such as heredity, salt intake, stress and obesity (BMI) may play a role in the development of hypertension [4]. This study was carried out to see the risk factors (sex, age, BMI, DBP, SBP, family history, dieting style etc.) of hypertension among school going children contain hypertensive symptoms.

OBJECTIVES

General objective

- To evaluate the risk factors of hypertension among the school going children in *Nababgonj, Dhaka*.

Specific Objectives

- To assess the complications among the school going children who are suffering from hypertension.

METHODOLOGY & MATERIALS

This was an observational study and was conducted in conducted in Paragon Hospital and Trauma Centre, Nababgonj Upazilla under Dhaka District, Bangladesh during the period from July 2018 to December 2018. We took 47 patients as study participants. The targeted age was 6-14 years. Children who suffering from chronic systemic disorder or psychological abnormality were excluded from the study. Anthropometric measurement were documented for all study population. Heights were measured by height scale and weights by talking bathroom scale [6, 7]. After that BP was recorded one by one using a mercury sphygmomanometer by the resident doctor with at least 10 minutes rest period before the measurement. While measuring BP the child was asked to sit comfortably. The cuff was wrapped around the right arm keeping the arm at the level of heart. The bladder of the cuff was inflated to about 200 mm Hg level, then it was deflated slowly at a rate of 1 mm per second. SBP was measured at the level of first appearance of sound (Korotkoff phase 1) and DBP was measured at the level of muffling of sound (Korotkoff phase IV) [4]. Readings were taken for four times at an interval of 20 minutes. All these four readings were recorded and their average was considered as the BP of that child at that time. After that children were given a questionnaire contains 10 questions to be filled up by their parents about the family history of hypertension and their complications, dietary history, education, occupation, monthly income of their parents. The data entered into the computer and analyzed by using Microsoft excel.

RESULT

In our study, 47 patients were included. They were selected by identifying hypertensive symptoms and among them t in the distribution the highest number 28 (60%) was found as male group and female was 19 (40%) (Figure-1). According to the age distribution of the participants the highest number of participants was found from 12-14 years' age group and it was 20 (42.55%). Followed by 16(34.04%) from 9-11 years' age group and 11(23.40%) from 6-8 age group (Table-1). According to the distribution of diastolic blood pressure (DBP) records varied in different level. The highest participants was found 13(27.66%) in the level of 96-100. After that study found 11(23.40%) participants in 91-95 level. Followed that 8(17.02%) in 86-90, 7(14.89%) in 76-80, 5 (10.64%) in 101-105 and the last number was found as 3(6.38%) in the level of 81-85 (Table-2). According to the distribution of systolic blood pressure (SBP) the highest perticipants was found in the level of 131-135 and the percentage was 15(31.91) followed by the next highest participants found in 126-130, respectively 12(25.53%), 9(19.15%) in 120-125, 7(14.89%) in 136-140, 4(8.51%) in 141-145 (Table-3). Distribute the patients according to their BMI (Body Mass Index) and found them in the variable as underweight, normal, overweight and obesity. According to these variables the highest participants found in overweight 16 (34.04%), followed by obesity 14 (29.79%), normal 10(21.28%) and underweight was 7(14.89) (Table-4). By following the risk factors of hypertention study try to find out the children who are hypertensive what's their family background, dieting style etc. in analyzing the educational status of the participants' fathers we found the number of them were primary educated were 19(40.43%) the next were found in secondary 14(29.79%), graduation and above were 8(17.08%) and illiterate was 6(12.17%). Again participants' mothers educational status we found most of them were primary educated and the number was 18(38.30%) the next was secondary 13(27.66%), 10(21.28%) were illiterate and 6(12.77%). According to the occupation status participants' fathers occupation highest number recorded in business sector and that was 28(59.57%), in others sector 14(29.79%) and in service sector 5(10.64%). Followed in mothers occupation almost 35(74.47%) participants' mother was housewife and 12(25.53%) in others sector. After that the parents income was counted. Maximum income range was record in 10000-<30000 and the number was 37(78.72%) then >30000 was 8(17.02%) and last <10000 was 2(4.26%). In the type of diet almost all participants are non-vegetarian and the number was 45(95.74%) and vegetarian was 2(4.26%). After then come to the point of additional salt intake 46(97.87%) found in positive and only 1(2.13%) found negetive and lastly we got the risk factor named Junk Food Intake 43(91.49%) daily/weekly and other 4(8.51%) monthly/none intake (Table-5).

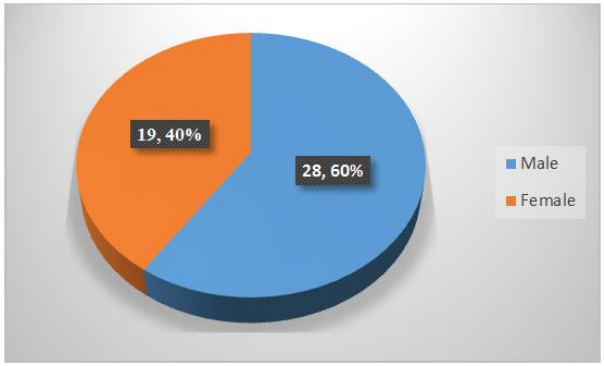

Fig-1: Male female distribution (N=47)

Table-1: Age distribution of participants (N=47)

Age (yrs)	n	%
6-8	11	23.40
9-11	16	34.04
12-14	20	42.55

Table-2: Distribution of diastolic blood pressure (N=47)

DBP	N	%
76-80	7	14.89
81-85	3	6.38
86-90	8	17.02
91-95	11	23.40
96-100	13	27.66
101-105	5	10.64

Table-3: Distribution of systolic blood pressure (N=47)

SBP	n	%
120-125	9	19.15
126-130	12	25.53
131-135	15	31.91
136-140	7	14.89
141-145	4	8.51

Table-4: Distribute the participants according to BMI (N=47)

BMI	n	%
Underweight (<18.5)	7	14.89
Normal (18.5-24.9)	10	21.28
Overweight (25-29.9)	16	34.04
Obesity (>30)	14	29.79

Table-5: Risk factors of hypertension (N=47)

Risk factors of hypertension		n	%
Father's education	Illiterate	6	12.77
	Primary	19	40.43
	Secondary	14	29.79
	Graduation & above	8	17.02
Mother's education	Illiterate	10	21.28
	Primary	18	38.30
	Secondary	13	27.66
	Graduation & above	6	12.77
Father's occupation	Service	5	10.64
	Business	28	59.57
	Others	14	29.79
Mother's occupation	Housewife	35	74.47
	Others	12	25.53
Parents income (BDT/month)	<10000	2	4.26
	10000-<30000	37	78.72
	>30000	8	17.02
Type of diet	Vegetarian	2	4.26
	Non-vegetarian	45	95.74
Additional Salt intake	Yes	46	97.87
	No	1	2.13
Junk Food Intake	Daily /Weekly	43	91.49
	Monthly/None	4	8.51
Family history	yes	27	57.44
	No	20	42.55
Passive smoking	Yes	25	53.20
	No	22	46.80

DISCUSSION

For this research we pick only that particular participants who have the symptoms of hypertension though it has no symptoms rather than headache, shortness of breath, chest pain, blurred vision, dizziness etc. But the participants selected by observing their systolic and diastolic pressure. This study showed the study patients as 47 patients were included from them 28 (60%) was found as male group and female was 19 (40%) (Figure-1). The study people was divided in age group and they were in between 6-14 years (Table-1). They are the school going children in Dhaka City and they have the primary symptoms of hypertension which counted by systolic and diastolic blood pressure maintaining a definite pause. According to the distribution of diastolic blood pressure (DBP) records varied in different level. The highest participants was found 13(27.66%) in the level of 96-100. After that study found 11(23.40%) participants in 91-95 level. Followed that 8(17.02%) in 86-90, 7(14.89%) in 76-80, 5(10.64%) I n 101-105 and the last number was found as 3(6.38%) in the level of 81-85 (Table-2). And the count of systolic blood pressure (SBP) the highest perticipants was found in the level of 131-135 and the percentage was 15(31.91) followed by the next highest participants found in 126-130, respectively 12(25.53%), 9(19.15%) in 120-125, 7(14.89%) in 136-140, 4(8.51%) in 141-145 (Table-3). These results resemble the findings of Laroia *et al*., [7] who found a direct correlation of SBP and DBP with age of the children. They also detected a spurt of SBP at 11, 12 and 13 years old boys and 12, 13 and 14 years old girls. For DBP they found a steady rise from 5 to 14 years in both sexes except 11 years in case of girls [7]. A similar study conducted by Anand *et al.*, [6] showed that BP increases with advancement of age with a spurt of systolic BP at 12 years of age in both sexes. These spurts of BP may be due to the effect of sex hormones liberated at the time of puberty [6]. By running this study we want to find out the risk factors behind hypertension.On them the concerns risk factors were as BMI, family situations(parents education, income etc), regular diet etc. This study also showed that hypertension in school going children had a significant relationship with obesity and family history of hypertension. Anand *et al*., [6] found that compared to their normal counterparts, prevalence of hypertension was 15 times more in obese children and 40 times more in children having family history of hypertension. In details, distribute the patients according to their BMI (Body Mass Index) and found them in the variable as underweight, normal, overweight and obesity . According to these variables the highest participants found in overweight 16 (34.04%), followed by obesity 14(29.79%), normal 10(21.28%) and underweight was 7(14.89%) (Table-4). That mean the children who are underweight, overweight and obese they are more hypertensive then normal. From the risk factors of hypertention, study try to find out the children who are hypertensive, what's their family background, dieting style etc. In analyzing the educational status of the participants' fathers we found the number of them were primary educated were 19(40.43%) the next were found in secondary 14(29.79%), graduation and above were 8(17.08%) and illiterate was 6(12.17%). Again participants' mothers educational status we found most of them were primary educated and the number was 18(38.30%)the next was secondary 13(27.66%), 10(21.28%) were illiterate and 6(12.77%). According to the occupation status participants' fathers occupation highest number recorded in business sector and that was 28(59.57%), in others sector 14(29.79%) and in service sector 5(10.64%). Followed in mothers occupation almost 35(74.47%) participants' mother was housewife and 12(25.53%) in others sector. After that the parents income was counted. Maximum income range was record in 10000-<30000 and the number was 37(78.72%) then >30000 was 8(17.02%) and last <10000 was 2(4.26%). In the type of diet almost all participants are non-vegetarian and the number was 45(95.74%) and vegetarian was 2(4.26%). After then come to the point of additional salt intake 46(97.87%) found in positive and only 1(2.13%) found negetive and lastly we got the risk factor named Junk Food Intake 43(91.49%) daily/weekly and other 4(8.51%) monthly/none intake (Table-5). Here we can see the ratio varied according to their in changing of the variable. In a similar study, Gupta AK [8] showed that children of parents with hypertension or other morbid cardiovascular events are more likely to have persistently elevated blood pressure than children from families without such a history.

LIMITATIONS OF THE STUDY

This was an observational study with a small sample size. The participants were selected by seeing their hypertensive symptoms. So, the study results might not be reflected in the whole community.

CONCLUSION

Hypertension among school going children are common. We found the risk factors were age, family history of hypertension, overweight, obesity, age group 12 -14 years, additional salt and junk food intake plays a vital role in development of hypertension have strong relationship with hypertension among school going children in rural area.

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