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Original Research

Prevalence of hypertension and its risk factors among school going adolescents

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ABSTRACT:

Background: An epidemiological shift from communicable to non-communicable diseases is occurring in developing nations. The present study was conducted to prevalence of hypertension and its risk factors among school going adolescents. **Materials & Methods:** 568 school children of both genders were selected. The questions pertaining to awareness and risk behavior in relation to CVD were taken from WHO's Global School based Student Health Survey (GSHS), which includes questions on eating behavior (like eating junk food, etc.,), physical activity, obesity, tobacco, alcohol use and their awareness about these. BMI was calculated by the formula: BMI=Weight (in kg)/ Height (in m2). Blood pressure is taken as normal when systolic and diastolic blood pressure is <90th percentile for gender, age and height. **Results:** O ut of 568 children, 450 were normal, 55 were PHT and 63 were HT, Maximum children with PHT and HT fall above age group >15 years. Among PHT, 24 were male and 31 were female and out of 63 HT, 42 were male and 41 were female. Among PHT boys, 9 were obese and among HT boys, 21 were obese. Among PHT girls, 6 were obese and among HT girls, 13 were obese. The difference was significant (P< 0.05). The mean SBP and DBP at 13 years of age was 105.2 mmHg and 64.2 mm Hg respectively. At 14 years was 106.4 mm Hg and 65.8 mm Hg and at 15 years and above, it was 108.4 mm Hg and 66.2 mm Hg respectively. The difference was significant (P< 0.05). **Conclusion:** During childhood and adolescence, risk factors for cardiovascular disorders may emerge. Early onset of risk factors raises the likelihood that they will persist as people age.Negative health habits, both new and persistent, support this surveillance. Regular blood pressure checks are necessary for all adolescent and teenagers in order to start corrective action as soon as feasible.

Keywords: adolescents, hypertension, Obesity

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INTRODUCTION

An epidemiological shift from communicable to non-communicable diseases is occurring in developing nations. While developing nations are following this trend, developed nations have already undergone this transformation.[1] A modern lifestyle increases the risk of heart disease and hypertension. The estimated prevalence of systemic HT is 1-2 percent in wealthy nations and 5-10 percent in developing nations such as India.[2] Obesity, a family history of HT, dietary changes, a decline in physical activity, and rising stress levels are risk factors for HT. HT is less common in children overall, but research indicates that it typically manifests in the first 20 years of life.[3]

About one billion people worldwide are impacted by HT, a serious health issue that is linked to high mortality and morbidity in both developed and developing nations.[4] It goes unnoticed during childhood and adolescence since signs and symptoms typically do not manifest at this time. The prevalence of HT rises during adolescence and with age.[5] It is a complex illness that is impacted by eating habits, geography, culture, race, and genetics. Blood pressure often rises as a person grows and develops. People who had elevated blood pressure as children have been seen to have elevated blood pressure as adults and as they age.[6] Hypertensive patients are more likely to develop ischemic heart disease. Although children's blood pressure is significantly lower than adults', it typically rises gradually over the course of the first 20 years of life.[7]The present study was conducted to prevalence of hypertension and its risk factors among school going adolescents.

MATERIALS & METHODS

The study was carried out on 568 school children of

both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. A questionnaire pertaining to risk behavior in relation to cardiovascular diseases were distributed among all. The questions pertaining to awareness and risk behavior in relation to CVD were taken from WHO's Global School based Student Health Survey (GSHS), which includes questions on eating behavior (like eating junk food, etc.,), physical activity, obesity, tobacco, alcohol use and their awareness about these. BMI was calculated by the formula: BMI=Weight (in kg)/ Height (in m2).Blood pressure is taken as normal when systolic and diastolicblood pressure is <90th percentile for gender, age and height. Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Age and gender wise distribution of hypertension among study subjects

Parameters	Variables	Normal (450)	PHT (55)	HT (63)
Age	13 years	100	15	14
	14 years	140	20	21
	15 and above	210	25	28
Gender	Male	230	24	42
	Female	220	31	41

Table I shows that out of 568 children, 450 were normal, 55 were PHT and 63 were HT, Maximum children with PHT and HT fall above age group >15 years. Among PHT, 24 were male and 31 were female and out of 63 HT, 42 were male and 41 were female.

Table II Distribution of hypertension according to nutritional status

BMI	Boys		Girls	
	PHT (55)	HT (63)	PHT (55)	HT (63)
Underweight	10	17	16	33
Normal	15	15	18	17
Pre- obese	21	10	5	10
Obese	9	21	6	13
P value	0.05		0.04	

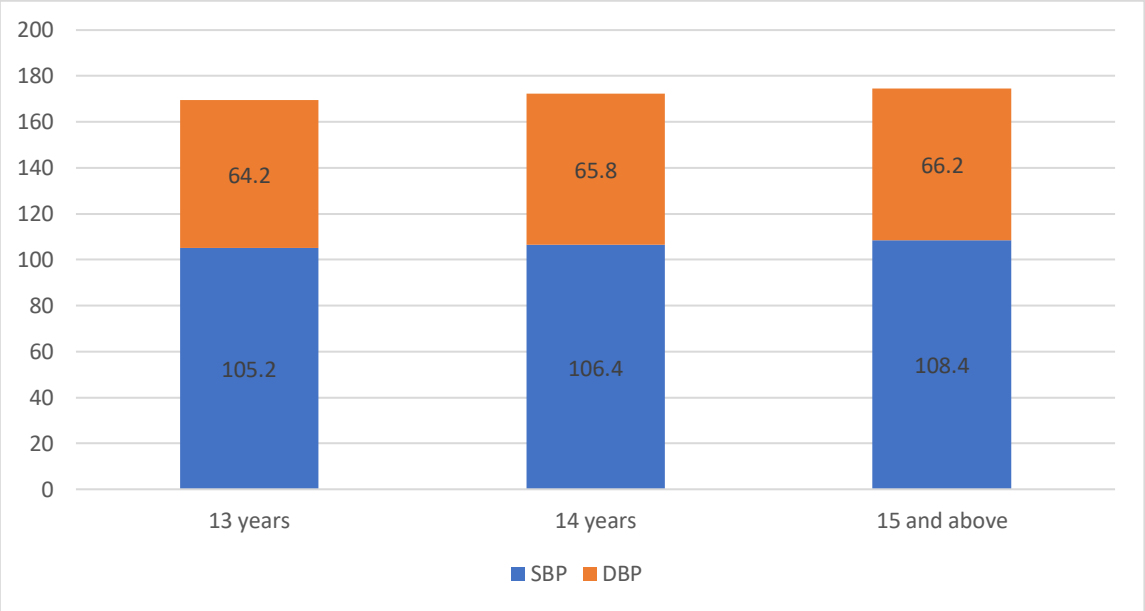
Table II shows that among PHT boys, 9 were obese and among HT boys, 21 were obese. Among PHT girls, 6 were obese and among HT girls, 13 were obese. The difference was significant (P< 0.05).

Table III Age group wise distribution of systolic and diastolic blood pressure

Age	SBP	DBP
13 years	105.2	64.2
14 years	106.4	65.8
15 and above	108.4	66.2
P value	0.01	0.02

Table III, graph I shows that mean SBP and DBP at 13 years of age was 105.2 mmHg and 64.2 mm Hg respectively. At 14 years was 106.4 mm Hg and 65.8 mm Hg and at 15 years and above, it was 108.4 mm Hg and 66.2 mm Hg respectively. The difference was significant (P< 0.05).

Graph I Age group wise distribution of systolic and diastolic blood pressure



DISCUSSION

It is well known that taking a child's blood pressure (BP) is a crucial part of a regular physical examination. Although children's blood pressure is significantly lower than adults', it typically rises gradually over the course of the first 20 years of life.[8] Body mass index (BMI) (obesity), age, sex, weight, height, family history of hypertension, social economic standing, and dietary habits all affect a child's blood pressure, which is continuously distributed. To comprehend the BP variable, local reference values must be constructed.[9] According to reports, between 1% and 3% of children have hypertension. Children's and teenagers' elevated blood pressure could be a precursor to essential hypertension in maturity.[10] It has been found that one of the many predictors of adult blood pressure is juvenile blood pressure.The present study was conducted to prevalence of hypertension and its risk factors among school going adolescents.

We found that out of 568 children, 450 were normal, 55 were PHT and 63 were HT, Maximum children with PHT and HT fall above age group >15 years. Among PHT, 24 were male and 31 were female and out of 63 HT, 42 were male and 41 were female. Sayeemuddin M et al[11]determined normal blood pressure (BP) in apparently healthy, asymptomatic school children in the age group of 6-16 years and determined the correlation of BP values with different sex, weight, height, and body mass index (BMI) and also to find out prevalence of hypertension in school going population.The mean SBP in males at 6 years was 99.69 ± 3.62 mm of Hg, at 10 years was 102.20 ± 2.16 mm of Hg, and at 16 years was 115.33 ± 1.26 mm of Hg. The mean SBP in females at 6 years was 96.55 ± 2.86 mm of Hg, at 10 years was 101.16 ± 2.12 mm of Hg, and at 16 years was 112.41 ± 1.06 mm of Hg. The correlation coefficient for relationship between age and SBP in males and females was 0.89 and 0.91, respectively, and for DBP was 0.92 and 0.90, respectively. The correlation coefficient for relationship between height and SBP in males and females was 0.91 and 0.93, respectively, and for DBP was 0.92 and 0.88, respectively. The correlation coefficient for relationship between weight and SBP in males and females was 0.92 and 0.92, respectively, and for DBP was 0.94 and 0.91, respectively. In the nomogram obtained in the study, 95% of study population fall between mean +2SD and -2SD.

We found that among PHT boys, 9 were obese and among HT boys, 21 were obese. Among PHT girls, 6 were obese and among HT girls, 13 were obese. Kumar et al[12]estimated the prevalence of HT and its risk factor among apparently healthy school going adolescents of Patna district. The mean systolic and diastolic blood pressure of study population was 107.4 mm of Hg (95% C.I. 106.93-107.77) and 67.4 mm of Hg (95% C.I. 67.26-67.54), respectively. Prevalence of pre-HT and HT was 10.9% and 4.6% in school going adolescents while prevalence of overweight/obesity was 1.5%. Both systolic and diastolic blood pressures had positive and significant correlation with age, height and body mass index. The proportion of children who had ever taken tobacco was 5.3%, cigarette smoking 4.3%, alcohol consumption 2.1%, and excess salt intake 22.3%. Only 49.1% children were doing physical activity at least one hour a day in past seven days for maintenance of good health.

We found that mean SBP and DBP at 13 years of age was 105.2 mmHg and 64.2 mm Hg respectively. At 14 years was 106.4 mm Hg and 65.8 mm Hg and at 15 years and above, it was 108.4 mm Hg and 66.2 mm Hg respectively. Taksande A et al[13]studied the blood pressure of school going children in a rural area and its relationship with the anthropometric indices.Of

2643 school children, 1227 were boys and 1416 girls with a male to female ratio of 1:1.16. 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, wherein there was a mild decrease in SBP (−0.09) as well as the DBP (−0.24). Correlation coefficient analysis showed highly significant positive correlation of height with SBP and DBP. There was a significant correlation of SBP and DBP with the weight, and body mass index (BMI). The prevalence of HT was 5.75% (i.e., 3.25% for systolic HT and 2.49% for diastolic HT).

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that during childhood and adolescence, risk factors for cardiovascular disorders may emerge. Early onset of risk factors raises the likelihood that they will persist as people age. Negative health habits, both new and persistent, support this surveillance. Regular blood pressure checks are necessary for all adolescent and teenagers in order to start corrective action as soon as feasible.

REFERENCES

1. Canner PL, Borhani NO, Oberman A, Cutler J, Prineas RJ, Langford H, et al. The hypertension prevention trial assessment of the quality of blood pressure measurements. Am J Epidemiol. 1991;134:379– 92.
2. Sinaiko AR, Gomez Marin O, Prineas RJ. Diastolic fourth and fifth phase blood pressure in 10-15 years old children: The children and adolescents blood pressure program. Am J Epidemiol. 1990;132:647–55.
3. Raitakari OT, Taimela S. Porkka KV, Telama R, Valimaki I, Akerblom HK, et al. Associations between physical activity and risk factors for coronary heart disease: the Cardiovascular Risk in Young Finns Study. Med Sci Sport Exerc. 1997;29:1055–61.
4. Janz KF, Dawson JD, Mahoney LT. Increases in physical fitness during childhood improves cardiovascular health during adolescence: the Muscatine Study. Int J Sports Med. 2002;23(suppl 1):S15–S21.
5. Prajapati J, Oza J, Prajapati P, Bhagyalaxmi A, Rawal VS. Prevalence of behavioural risk factors of cardiovascular diseases among school going adolescents of Ahmedabad, Gujarat. HPPI. 2009;32(4):198-203.
6. Singh AK, Maheshwari A, Sharma N, Anand K. Lifestyle associated risk factors in adolescents. Indian J Pediatr. 2006;73(10):901-06.
7. Mohan B, Kumar N, Aslam N, Rangbulla A, Kumbkarni S, Sood NK, et al. Prevalence of sustained hypertension and obesity in urban and rural school going children in Ludhiana. Indian Heart J. 2004 56:310–14.
8. Chadha SL, Tandon R, Shekhawat S, Gopinath N. An epidemiological study of blood pressure in school children (5–14 years) in Delhi. Indian Heart J. 1999 51:178–82.
9. Sarin D, Chaturvedi P. Normal blood pressure and prevalence of hypertension in school going children. J MGIMS. 1997;1:32–35.
10. Lauer RM, Clarke WR, Beaglehole R. Level, trend, and variability of blood pressure during childhood: The Muscatine study. Circulation. 1984;69(2):242–49.
11. Sayeemuddin M, Sharma D, Pandita A, Sultana T, Shastri S. Blood pressure profile in school children (6–16 years) of Southern India: A prospective observational study. Front. Pediatr. 2015;3:24.
12. Kumar P, Kumar D, Ranjan A, Singh CM, Pandey S, Agarwal N. Prevalence of hypertension and its risk factors among school going adolescents of Patna, India. Journal of clinical and diagnostic research: JCDR. 2017 Jan;11(1):SC01.
13. Taksande A, Chaturvedi P, Vilhekar K, Jain M. Distribution of blood pressure in school going children in rural area of Wardha district, Maharashatra, India. Annals of pediatric cardiology. 2008 Jul 1;1(2):101-6.