



Study of Blood Pressure and Influence of Addiction in Adolescent Males of Slum Area of Raipur City, Chhattisgarh

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ABSTRACT

Introduction: Non communicable diseases like hypertension, cardiovascular diseases, also a major health problem in adolescent along with communicable diseases. This study to know the prevalence of hypertension and influence of addiction among adolescents male (10-19 years).

Materials & methods: 600 adolescent males living in slum area were undergone anthropometric measurement including Body mass index (BMI) and three times blood pressure measured and result were compared with WHO standards.

Results: Out of the total 600 adolescent males, 13 (2.1%) cases were hypertensive. The mean systolic blood pressure 108.72 mm Hg and diastolic blood pressure 64.23 mm Hg. Raised blood pressure seen in 5.2% of addicted population as compared to 1.44% in non addicted population.

Conclusion: Prevalence of hypertension increases with age, BMI and addiction.

KEYWORDS : hypertension, adolescent, addiction, body mass index

Introduction:

India has largest population of adolescent (243 million) among world and constitutes 22.8% of total Indian population. Adolescent is crucial period of life since there are unique psychosocial & physical changes occurs. Now a day due to changing life style, high blood pressure not only common in adults but also in children. Obesity is one of the important responsible factors of childhood hypertension¹. Blood pressure is influenced by various factors likes Age, Gender, Height, Weight, Genetic factors. Blood pressure reading elevated on single occasion doesn't necessarily mean that there is high blood pressure, but it does warrant repeated measurements. Recommendations suggest that the BP must be measured at least three consecutive occasions before a child is diagnosed with hypertension². There are only few studies examining the distribution and the differences in blood pressure (BP) of adolescents in slum of Chhattisgarh.

Adolescence is vulnerable period for substance uses which have several systemic affect. Cardiovascular problem resulting from chronic alcohol and drug intake have potentially harmful implications.

Therefore these studies evaluate the prevalence of hypertension in adolescents of age group between 10-19 years in slum area of Raipur (C.G.). The detection of hypertension during childhood is of potential value in identifying those, who are at increased risk of primary hypertension as adults.

Material and methods:

This study was based on cross-sectional observational study conducted in different slum area of Raipur city during period from September 2012 to September 2013. Permission was taken from Institutional Ethical Committee before starting of study. Sample size was 600, male adolescents aged between 10-19 years.

The subjects were chosen from different slums area of Raipur city by applying random sampling method. Detail histories regarding addiction were obtained and Vocal consent was taken from child or his parents before measuring height, weight, and blood pressure.

Prerequisite follow according to fourth report on diagnosis, evaluation and treatment of high blood pressure in children and adolescents². Before measuring the blood pressure, children's are divided into groups of 15 were taken to a separate place away from noise, and explained in detail, the procedure of blood pressure recording neither painful, nor harmful. Measured in right arm in sitting posi-

tion with appropriate cuff and same mercury sphygmomanometer was used throughout the study. Those were Excluded from study who had cardiovascular, renal and others diseases through detail history which affect blood pressure^{13,14}.

Height was measured with the help of measuring tape and asking the child to stand straight, barefoot on the ground with heels, buttocks, upper back, and occiput must be firmly contact with the wall. The chin is tucked in slightly and the head is held erect (to maintain Frankfort plane) the cardboard was pressed firmly onto the subject's head to form a right angle to the wall³.

Weight was recorded using standard weighing machine. Weight was measured at the same time of day, with same machine and to the same degree of accuracy to the nearest of 0.5 kg. Body Mass Index was calculated based on the formula $BMI = \text{Weight in kilogram} / (\text{Height in meter})^2$.

Correlation of BMI and Addiction with BP and statically analyzed by correlation t-test (Graph pad software) and chi-square test respectively.

Result:

Table 1 showed Prevalence of hypertension increases with age in adolescent except between age of 12 to 13 years minimum (1.65%) 1.71% between 10-11 years, 2.5% in 14-15 years, 4.4% in 16-17 years and maximum (4.76%) between 18-19 years of age.

The overall mean systolic blood pressure (SBP) 108.72 mm Hg (range 90-138 mm Hg) and mean diastolic blood pressure (DBP) 64.23 mm Hg (range 60-88 mm Hg). Correlation of Body Mass Index with SBP and DBP Statically analyzed by using correlation t-test (Table 2a & b).

When Blood pressure correlate with addicted adolescents: out of 600 122 are addicted to smoking. BP raised in 5.2%, 1.45%. In addicted and non addicted cases respectively & statistically analyzed by using chi-square t-test (table 3).

r= pearsons correlation coefficient, p=highly significant two tailed value, S=significant, NS= Not significant.

Present study show that correlation coefficient (r) of BMI with SBP and DBP are 0.68 and 0.66 respectively and p value <0.001.

Discussion:

Adolescence is period of rapid development between childhood and adulthood involving complex physical and psychological changes. The interactions of these multidimensional factors have considerable implications for adolescent development. Adolescent phase considered as the most important time when future health is determined. Blood pressure play as a very significant factor to produce cardiovascular diseases in children^{15,16,17}.

The present study was carried out in different slum area of Raipur city between age group of 10 to 19 years of age.

The overall mean systolic blood pressure (SBP) 108.72 mm Hg (range 90-138 mm Hg) and mean diastolic blood pressure (DBP) 64.23 mm Hg (range 60-88 mm Hg). In present study the correlation coefficients (r) of body mass index (BMI) with systolic blood pressure and diastolic blood pressure are 0.68 and 0.66 respectively (P<0.001). Showing significant positive correlation between body mass index and blood pressures.

When blood pressure correlate with addicted and non addicted cases and p value calculated. The two-sided P value is 0.0141, considered significant.

Similar studied by others workers:

Saha et al (2008) prevalence of hypertension and variation of blood pressure with age among adolescent in chetla Kolkata. Found maximum cases between 18-19 yrs of age group (6.9%) and minimum between 10-11yrs & 14-15 yrs (1.9%) of age group. others age group 12-13 yrs, 16-17 yrs had 2.4% and 2.5% respectively. The tendency of blood pressure to rise with age is supported by findings from Turkish study among 13-18 years,Zambian school children (7-16 years) and German study(4-18 years) . In the Jamaican study (6-16 years) , blood pressure increased with age in both boys and girls

M.B. Soudarssanane et al (2006) ⁵ 673 adolescents (males 351, females 322) in the 15-19 years age group. MBP and prevalence of hypertension increased with, weight, height and BMI. Srinivas in 1991 reported mean SBP of 117 mmHg and mean DBP of 74mmHg among 1025 adults with prevalence of hypertension of 5.5%.

Muralidharan et al (1996) followed the same cohort in 1996 and recorded mean blood pressure of 121/82 mmHg and prevalence and incidence of 7.1 % and 1.4% respectively.

Swanker Madhusudan et al (2012)⁶ Study conducted between age group of 11-19 years of jaipur and compare rural and urban adolescent. Mean SBP and DBP among the male students were 108.8 mm hg and 72.6 mm hg. Blood pressure correlate with BMI: N. L. Nanaware-1 et al (2011)⁷ the statistical analysis was done using correlation t-test. There was significant positive correlation between BMI with both systolic as well as diastolic blood pressure.

Gilles Paradis et al⁴ (2004)⁸ by multiple linear regression analysis found that body mass index was consistently associated with SBP and DBP in all age-gender groups. David S. Freedman et al⁹ found that overweight was more strongly related to elevated levels of DBP and concluded that overweight children and adolescents are at a substantially increased risk for adverse levels of several cardiovascular disease risk factors. Berkey CS et al (1998)¹⁰ confirmed that greater BMI in adolescence is associated with raised BP. Jonathan Sorof¹¹ (2002) concluded that obesity has become an increasingly important medical problem in children and adolescents.

Aneesa M. Al -Sendi et al ¹²(2003) showed that weight and height in boys and weight only in girls were significantly associated with systolic BP independent of age or percentage fat. BMI and percentage body fat were significantly and positively associated with the risk of having high BP in the boys and girls. Schiel R et al(2006)⁹ after investigating the associations and interactions between height, weight, body-mass index and blood pressure values in overweight / obese and normal weight children and adolescents found that overweight and obese children had significantly higher blood pressure values both systolic as well as diastolic than control subjects.

Table 1 Age and stage wise distribution of cases

Age in year	No. of cases	%	proportion	CI of proportion
9-13 year(early adolescent)	414	69	0.69	0.6457-0.7343
14-15 year(mid adolescent)	120	20	0.20	0.1285-0.2715
16-19 year(late adolescent)	66	11	0.11	0.0346-0.1854

distribution of cases according to BMI

BMI	No. of cases	%	proportion	CI of proportion
<5 th Centile	397	66.16	0.6616	0.6150-0.7081
5 th -84 th Centile	191	31.83	0.3183	0.2522-0.3843
85 th -94 th Centile	12	02.00	0.02	-0.0920-0.0992
>95 th Centile	00	00.00	0.00	00.00

Table 2a prevalence of hypertension adolescent male among

Age(yrs)	No. of cases	No. of hypertensive	%
10-11	233	4	1.71
12-13	181	3	1.65
14-15	120	3	2.5
16-17	45	2	4.4
18-19	21	1	4.76
Total	600	13	2.1 %

Table 2b correlation of Body Mass Index with SBP and DBP

	r	P value
SBP	0.68	<0.001 (significant)
DBP	0.66	<0.001 (significant)

Table 3 Correlation of blood pressure with addicted and non addicted cases

Blood pressure	No. of addicted	%	No. of non addicted	%
Normal	115	94.27	471	98.55
<Normal	00	00.0	00	00.00
>Normal	07	5.72	07	01.45
Total	122	100	478	100

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