

## Relation Between Hypertension and Obesity in Children Between 5-12 Years of Age

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### ABSTRACT

**Objectives:** Obesity and high blood pressure are a well-known combination. Some studies show that development of hypertension in kids, teenagers, adults, which eventually led to heart disorders. We measured that blood pressure of 15 school-aged kids (ages 5–12) for 06 months, beginning in February 2019 to October 2019, while also providing Regular nutrition class and activities to assess the impact of nutrient as a routine life mediation on the kids' body composition, weight, and blood pressure school-aged children prevention programmer. In children and young children, obesity is an indisputably serious clinical problem. From 2001 to 2010, public research establish that the frequency of weighty in children increased from 6% to 14%. The consequences of adolescent obesity.

**Methodology:** It was a cross-sectional study conducted in a hospital. The Department of Paeds Medicine, P.E.M.H, Rawalpindi, Pakistan, conducted this descriptive case series. The research lasted a year. Over the course of a year, from February 2019 to October 2019, the number of children aged 5–12 years who were called in for a regular health check-up from around 100 patients was lower normal low cohorts than in the weighty and obese group. This shows a link between obesity and hypertension. During the hour of time spent in two groups, pulse levels decreased. This could be the result of the personalized mediation or the children adjusting to the new situation. A large number of children were fearful.

**Results:** Systolic pulse values can be seen in the results. In the standard group, fifteen children (10 M kids and 05 F kids) had circulatory strain in the 90th percentile or above in at least one calculation. In this study, 15 children (10 M kids and 5 kids F) in the intercession group reported increased cardiovascular strain in at least one estimate.

**Conclusion:** Fat loss is the main-route antihypertensive therapy in children having high blood pressure caused by obesity. In addition, in the management of obesity-related high blood pressure, establishing heart-healthy life that take in daily bodily exercise also a food rich in berries and root vegetable, fibre, that is also low in complex carbohydrate and sweet cold drink critical. This may be problematic in children with stoutness, which is often associated with comorbid illnesses and depression and anxiety decreased flexibility. For maximum adequacy, a multidisciplinary approach is frequently expected. A small number of children will require antihypertensive medication. Both are not effective to lowering blood pressure in children. In any case, the reduced CV events observed in adults treated with RAAS inhibitors are promising.

**Keywords:** Relationship; hypertension; obesity; children

### INTRODUCTION

The relationship between obesity and high blood pressure in T.2.D.M patients. As obesity became more severe, the prevalence T2DM in high blood pressure increased [1, 2]. From 2001 to 2007, Pinhas-

Hamiel study shows that et al [6] found a 10-fold newly diagnosed type 2 diabetes kids in teenagers. This group's average BMI was 28 kg/m<sup>2</sup>. 2 3-4 Leupker et al., [5] found a link between BMI and systolic pressure in middle school adolescents period 11 to 16 ages between 2000 and 2010. This link between obesity and hypertension in children has been accounted for in numerous studies involving a diverse range of ethnic and racial groups, with Almost all studies found worse hypertension and a higher prevalence of hypertension in obese children versus fit children. The study conducted by Dr. Rosner et al., [1], pooled data from 9 large U.S epidemiological study over 42,000 kids to depict pulse changes among high contrast kids based Irrespective, orientation, or age, the risk of high circulatory strain was meaningfully higher for kids the versus lower docile of BMI, the risk proportion of hypertension from

2.4 to 3.6. According to Freedman study et al., [2], overweight kids in the (Bogalusa) Heart Study were 3 to 4 times more likely to have important in systolic blood pressure Separately, calculate the circulatory strain and the diastolic pulse. Some school-based hypertension and obesity study, Sorof et al., out a paired higher frequency of hypertension in large compared to no fat young people [3-5]. According to all books fat related hypertension is characterized by a large proportion cut off systolic blood pluses (systolic hypertension deprived of diastolic hypertension) multicenter trial of antihypertensive medication in kids revealed 38 percent of the one forty topics enrolled in the trial had

isolate systolic high blood pressure [6-9]. In obese subjects, the prevalence of isolate systolic high blood pressure was 49 percent (24/49) compared to 29 percent (26/89) in non-obese subjects. Shroff et al., found that the frequency of isolated systolic high blood pressure amongst youngsters who were fatty and had plasma pressure above the 92nd percentile on a single set sizes 92% in their school-based screening for high blood pressure and obesity. The Update twenty-four from Task on High circulation Control in Kids and Adolescents provided population-based percentiles for blood pressure values in children adjusted for age, gender, and height. Values that exceed the 90th and 92nd percentiles are classified as "high normal blood pressure" and "hypertension," respectively. Thus, the identification of the blood pressure threshold for high blood pressure in a child first requires the determination of height percentile [10-12].

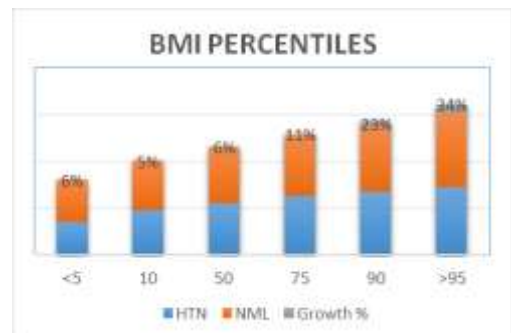


Fig 1: Depicts the classification of BMI percentiles and the prevalence of hypertension within each BMI percentile

The BMI category. NML stands for normotensive; HTN stands for hypertensive



Fig 2: Cuff chart for proper positioning and determination of pulse sleeve in kids

**Obesity Problem in Children:** Overweight has become an increasingly important medical consequence of obesity, which was previously thought to be a disease of children and adults but is now affecting children as well. High blood pressure, T2DM, dyslipidemia, left ventricular hypertrophy, nonalcoholic steatohepatitis, obstructive sleep apnea, plus muscular issues are among the outcomes associated with childhood obesity (like slipped capital-femoral epiphysis). According to conventional wisdom, hypertension in children is an intriguing condition that is normally linked with renal disease. In reality, dry hypertension in kids as a result of renal disease is (ie, essential) hypertension. Obese children with a high pulse variance among of proximal and distal upper arm peripheries as twenty cm, by the average variance being 8.6 cm. Lastly, though the mid-arm border of overweight children is frequently larger than would be expected for their age, their manageable distance is not the same as would be expected. As a result, the arm length is disproportionately squat for the cuff needed for the measured arm circumference. The correctly size cuff will regularly overlap the cubital fossa, creating manual auscultation problematic and increasing the option of wrong quantities.

Table 1: Evaluating Special feature of children obesity

<p>Point by point history</p> <ul style="list-style-type: none"> <li>• Sleeping history                             <ul style="list-style-type: none"> <li>• Daytime somnolence</li> <li>• Snoring</li> <li>• Witnessed apneic events</li> </ul> </li> <li>• Diet history                             <ul style="list-style-type: none"> <li>• Sugar-sweetened beverage intake</li> <li>• Fiber intake</li> <li>• Total calories consumed</li> <li>• Timing and frequency of meals</li> <li>• Active work</li> <li>• Amount and intensity</li> <li>• Bone pain</li> </ul> </li> <li>• Psychosocial history                             <ul style="list-style-type: none"> <li>• Sadness</li> <li>• Concern</li> </ul> </li> </ul>	<p>Comprehensive physical exam</p> <ul style="list-style-type: none"> <li>• Anthropometrics                             <ul style="list-style-type: none"> <li>• Abdomen palpation</li> <li>• Menbrane exam</li> <li>• Acanthosis Nigricans</li> <li>• Hirsutism</li> <li>• Striae</li> <li>• Hepatomegaly</li> </ul> </li> </ul>
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**Examinations to study, mostly in kids with obesity and hypertension:**

- These challenges and particularly Problem and Accu-Evaluating Special feature of kids fatness.
- Polysomnography Obstructive rest- (apnea)
- Toxicology screen Depressions and anxiety are improved in obese children, leading to increased risk for illicit substances

**Treatment Approach to High Blood Pressure Related Obesity:** The main method for all children with high blood pressure-related

weight problems should be to motivation on the disappointment solid heaviness and the success of a heart-healthy life. The (A.A.P) mentions made method to dealing with obesity treatment, with increment trouble recommended for children aged 5-12 years. When I'm in the fat gathering and weighting class, I'm saving for developing children. When I'm in the overweight class, I'm saving for developing children. Weight adversity is especially significant for children with hefty- relate hypertension because we know that basic a etiology worsens comorbidities and decreases S.N.S inspiration moment, resulting in lowering of BP. Examinations that are colourfully directed Children are aged 5 to 12 years old have shown an effect of weight loss on low B.P in kids. The trainings focused on completely consolidated eating routine, physical exertion, training, and guiding and established a reduction in SBP from 5 to 12 mmHg above 01-to 12-month intervals venation. Additional dynamic aspect and changes required to treat fat-related high blood pressure is dietary change. In 2018, updated salutary recommendations for the treatment of high blood pressure, regardless of the stage or etiology of high blood pressure, were issued.

- Better eating of vegetables, natural products, and decreased carb, fat, and handled sugar consumption
- Incomplete/prevention of sugar-enhanced drinks
- Increased intake of food sources dietary fiber (age +05 = grams/day up to 12g/1000 kcal)

Nutritional supplements lower blood pressure in both children and adults. Some trials in Pakistani women with pre- or stage (1) hypertension start that ensuring a low diet with a high sodium admission (linked to a standard eating regimen with high sodium feeding) reduced systolic blood pressure by 6.1 (92 CI 3.0-8.1) mmHg and by 8.2 (92 CI 6.1-09) mmHg

while ensuring a low-sodium diet in the setting of a Usual eating routine (compared to a high When the two courses were performed concurrently, systolic BP was reduced by 10.3 (92 CI 8.4-12.1) mmHg used both When hypertensive young people signed up for a center-grounded social aliment agreement emphasising a Gusto- type diet, systolic BP was reduced by 10 mmHg and diastolic BP was reduced by 6 mmHg compared to those recommended an energy- type diet. Avoiding sugary drinks can lead weight loss in kids and has been connected in hypertension in adults. 2 major studies in kids, one of fat/stout kids and other of standard weight kids, both found that eliminating sugar-drinks causes a decrease in weight and obesity proportions. Routine BP Interventions in Daily Life Primary control, Dropping one to 11 serving of sugary drinks per day among adults older than 16 months was related with a drop in systolic pulse of 1.5 mmHg (92 CI 1.2-2.4) and diastolic blood pressure of 1.1mmHg (92 CI 0.7-1.4) outcomes continued critical level after conforming to the weightiness modification.

Currently no rules about grade of sodium drop in kids for the handling of hypertension. Kids should defy the Food Comments for Americans 2012- 2018, which conditions that kids should edge their daily sodium intake of 100mg 15 times a day, and adolescents should limit their sodium eating even more, with mg as the high acceptable contravention fact for kids aged 1-4 years. There is sign that these offers may have a greater negative impact on BP among children and young people who are fat/fat than Consistent sodium intake was plumbd by many 24 analyses in an higher effort on that elaborate 5234 kids 5-12 years, 34 of whom were fat In overall, mean sodium admission was much more prominent than suggestions, with mean admission mg/day. In general, every 1.mg of sodium drinking per day.

**Pharmacologic Therapy:** Children obesity-related high blood pressure should be supported in making healthy lifestyle changes Furthermore, kids with active hypertension after 04-11 years of beginning a healthy heart way of life should be supported with a drug to minor their BP though they continue dicing down at weight loss in routine life changes. As with any medicine, the specific arbitrator chosen should be aimed toward examining the

fundamental etiology of this go- between can likewise further develop insulin obstruction and dyslipidemia and can make glucose and uric acid levels, Blood pressure should be reduced to less than the 91<sup>st</sup> percentile, or less than 128/80 for children under the age of 13.

## CONCLUSION

There are numerous ways to treat obesity, which can result in high blood pressure and an increased risk of heart disease. Furthermore, in the treatment of stoutness-related hypertension, an institute-related heart sound routine way of life that recalls standard active work and an eating regimen rich in products of the soil, fibre, and dairy, that carbs and sweet drinks is required. Weight problems in adolescents present a number of challenges. Many children will be subjected taken antihypertensive medical cure. In kids, no reason has been shown to be more effective than another at lowering circulatory strain.

## REFERENCES

1. Rosner, B., Cook, N., Portman, R., Daniels, S., & Falkner, B. (2008). Determination of blood pressure percentiles in normal-weight children: some methodological issues. *American journal of epidemiology*, 167(6), 653-666.
2. Freedman, D. S., Mei, Z., Srinivasan, S. R., Berenson, G. S., & Dietz, W. H. (2007). Cardiovascular risk factors and excess adiposity among overweight children and adolescents: the Bogalusa Heart Study. *The Journal of pediatrics*, 150(1), 12-17.
3. Weintraub, W. S., Daniels, S. R., Burke, L. E., Franklin, B. A., Goff Jr, D. C., Hayman, L. L., ... & Whitsel, L. P. (2011). Value of primordial and primary prevention for cardiovascular disease: a policy statement from the American Heart Association. *Circulation*, 124(8), 967-990.
4. Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents. (2011). Expert panel on integrated guidelines for cardiovascular health and risk reduction in children and adolescents: summary report. *Pediatrics*, 128(Supplement 5), S213-S256.
5. National High Blood Pressure Education Program Working Group on High Blood Pressure in Children and Adolescents. The fourth report on the diagnosis, evaluation, and treatment of high blood pressure in children and adolescents *Pediatrics* 2004; 114, 555-576. DOI:10.1542/peds.114.2.S2.555
6. Ostchega, Y., Hughes, J. P., Prineas, R. J., Zhang, G., Nwankwo, T., & Chiappa, M. M. (2014). Mid- arm circumference and recommended blood pressure cuffs for children and adolescents aged between 3 and 19 years: data from the National Health and Nutrition Examination Survey, 1999– 2010. *Blood Pressure Monitoring*, 19(1), 26-31.
7. Palatini, P., & Frick, G. N. (2012). Cuff and bladder: overlooked components of BP measurement devices in the modern era?. *Am J Hypertens*, 25, 136–138.
8. Nguyen, N. T., Magno, C. P., Lane, K. T., Hinojosa, M. W., & Lane, J. S. (2008). Association of hypertension, diabetes, dyslipidemia, and metabolic syndrome with obesity: findings from the National Health and Nutrition Examination Survey, 1999 to 2004. *Journal of the American College of Surgeons*, 207(6), 928-934.
9. Bramlage, P., Pittrow, D., Wittchen, H. U., Kirch, W., Boehler, S., Lehnert, H., & Sharma, A. M. (2004). Hypertension in overweight and obese primary care patients is highly prevalent and poorly controlled. *American journal of hypertension*, 17(10), 904-910.
10. Parker, E. D., Sinaiko, A. R., Kharbanda, E. O., Margolis, K. L., Daley, M. F., Trower, N. K., & O'Connor, P. J. (2016). Change in weight status and development of hypertension. *Pediatrics*, 137(3), e20151662.
11. Ogden, C. L., Carroll, M. D., Fryar, C. D., & Flegal, K. M. (2015). Prevalence of obesity among adults and youth: United States, 2011-2014. *NCHS Data Brief*, 219, 1-8.
12. Friedemann, C., Heneghan, C., Mahtani, K., Thompson, M., Perera, R., & Ward, A. M. (2012). Cardiovascular disease risk in healthy children and its association with body mass index: systematic review and meta-analysis. *Bmj*, 345, e4759.
13. Strong, J. P., Malcom, G. T., McMahan, C. A., Tracy, R. E., Newman III, W. P., Herderick, E. E., & Pathobiological Determinants of Atherosclerosis in Youth Research Group. (1999). Prevalence and extent of atherosclerosis in adolescents and young adults: implications for prevention from the Pathobiological Determinants of Atherosclerosis in Youth Study. *Jama*, 281(8), 727-735.
14. Brady, T. M., Fivush, B., Flynn, J. T., & Parekh, R. (2008). Ability of blood pressure to predict left ventricular hypertrophy in children with primary hypertension. *The Journal of pediatrics*, 152(1), 73-78.
15. Brady, T. M., Appel, L. J., Holmes, K. W., Fivush, B., & Miller III, E. R. (2016). Association between adiposity and left ventricular mass in children with hypertension. *The Journal of Clinical Hypertension*, 18(7), 625-633.
16. Berenson, G. S., Srinivasan, S. R., Bao, W., Newman, W. P., Tracy, R. E., & Wattigney, W. A. (1998). Association between multiple cardiovascular risk factors and atherosclerosis in children and young adults. *New England journal of medicine*, 338(23), 1650-1656.