

DOI: 10.21767/2572-5394.1000e101

Childhood Obesity and Hypertension

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The epidemic of obesity along with hypertension (HTN) and cardiovascular disease is a growing contributor to global disease burden. The prevalence of HTN and pre-hypertension in children has been rising steadily over the decades to nearly 4% and 10% respectively [1,2]. Paediatric hypertension is one of the strongest predictor of adult hypertension, which increases the cardiovascular mortality risk in adults [3]. Obesity in childhood is found to be associated with hypertension, dyslipidemia, impaired glucose metabolism and other metabolic and physical consequences like left ventricular hypertrophy, nonalcoholic steatohepatitis, obstructive sleep apnea, orthopedic problems, and psychosocial problems. A literature review found that the risk of adult obesity is at least twice as high for obese children as for non-obese children, as about a third of obese preschool children were obese as adults, and about half of obese school-age children were obese as adults [4]. Adults who have been obese as children may have an even greater prevalence of risk factors for CVD, including hypertension and dyslipidemia, compared with those who had normal weight as children. It has also been shown that childhood obesity and central adiposity increased the risk for the metabolic syndrome in adulthood [5].

Although it is imperative to identify young hypertensive patients who need appropriate interventions, HTN and pre HTN are underdiagnosed in paediatric population. Measuring blood pressure (BP) is difficult in children as BP levels may vary on a minute to minute basis in response to a number of physiological and environmental stimuli. Ambulatory blood pressure monitoring (ABPM) may overcome these challenges and help to characterize BP levels and variability for a better risk stratification and prediction of cardiovascular disease outcome. White coat hypertension (WCH) is extremely common in Paediatric population, who are anxious in medical setting with an incidence exceeding 40% [6]. ABPM is especially useful, and the only tool to identify WCH, as well as those with masked hypertension (normal BP in the clinic but elevated by ABPM).

Management of prehypertension and stage 1 hypertension in obese primarily involves lifestyle modification and weight reduction. Medications are required in stage 2 hypertension. The benefits of weight loss for blood pressure reduction in children have been demonstrated in both observational and interventional studies. A systemic review and meta-analysis

considering effect of childhood obesity prevention programs on blood pressure concluded that obesity prevention programs have a moderate effect on reducing BP, and those targeting both diet and physical activity seem to be more effective [7]. Litwin et al. assessed the effects of 12 months of non-pharmacological and pharmacological therapy in children with hypertension and concluded that twenty-four hour systolic and diastolic blood pressure (BP), left ventricular mass index, prevalence of left ventricular hypertrophy, carotid intima-media thickness, and LDL-cholesterol decreased. Standard antihypertensive treatment, increase in lean body mass, decrease in abdominal obesity correlated with target organ damage regression [8].

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