Background

- High blood pressure (BP) and overweight/obesity are important public health issues because they are increasingly prevalent in children and when both are present they may potentiate the development of cardiovascular pathology.1
- The majority of research linking excess body weight with hypertension has used BMI as the weight status descriptor. Despite its popularity, BMI is a poor metric of regional or total adiposity. 2
- Waist circumference (WC) and neck circumference (NC) are the most commonly used indexes of central adiposity. Several investigators have explored the association of WC with elevated BP but WC measurement has drawbacks such as it is time consuming and culturally or environmentally problematic. 3
- Other measures of central obesity such as NC are being explored as predictors of cardiovascular risks.

Objective

- To examine the associations of excess weight indicators including body mass index (BMI) and NC with high BP in children

Methods

- A prospective observational clinical study
- Children aged 6-18yr undergoing elective non-cardiac surgeries under general anesthesia were classified by their NC measurements into neck groups.
- Prehypertension was systolic or diastolic BP levels between 90th and 95th percentile for gender, age and height. Hypertension was systolic and/or diastolic blood pressure levels ≥ 95th percentile for age, gender and height.
- Rates of perioperative high BP were compared between BMI and NC groups.

Results

- The prevalence of elevated BP was 29.2%; prehypertension was 10.1% and hypertension was 19.1%. The overall prevalence of overweight and obesity was 19.0% and 18.7% respectively.
- The prevalence of wide NC increased progressively with weight status thus: 8.8%, 29.4% and 68.7% among normal weight, overweight and obese children correspondingly (Figure 1).
- NC and BMI identified children with elevated BP (Table 1).
- High NC measurement remained the most prominent predictor associated with elevated BP. Children with high NC values had nearly twice the odds of having elevated BP as their peers with normal NC (Table 2).

Conclusion

- High BP is increasingly prevalent in children with central adiposity.
- Increasing NC and BMI are associated with elevated BP in children.
- NC appears to be better at identifying boys with elevated BP and performed as well as BMI in identifying girls with high BP.
- NC measurement may be a simple tool to screen for elevated BP in children.

References