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Reliability of body mass index in predicting cardiovascular risk factors in overweight and obese children

Vishnu Sivapathar¹, Liyanage P², Sivakanesan R, Arulpragasam A N and Sujirtha³

¹Eastern University, Sri Lanka

²District General Hospital, Matara, Sri Lanka

³University of Peradeniya, Sri Lanka

⁴Eastern University, Sri Lanka

Introduction: Childhood overweight and obesity is in an increasing trend throughout the world. Distribution of body fat is an important determinant in predicting the future cardiovascular risk factors. Body Mass Index (BMI) is the commonly used tool in diagnosing overweight and obesity. Waist circumference (WC) percentile and waist height ratio (WHtR) demonstrated high sensitivity and specificity for detection of abdominal fat mass.

Aim: The aim of this cross sectional study involving children from an urban area, Sri Lanka aged 3-18 years was to investigate the reliability of BMI in predicting central adiposity.

Method: Weight, height, and WC were measured using standard methods and BMI, and WHtR were calculated. The BMI of 85th and 95th percentiles were adopted as cut-off points for overweight and obesity respectively and similar values were considered for WC to define obesity and overweight based on age and sex as per centre for disease control classification. WHtR 0.6 and 0.5 were considered as alert line and action line for interventions respectively.

Findings: Among 116 subjects, 29 (25%) were overweight and 87 (75%) were obese. According to WC percentile 9 (7.7%) were overweight while 107 (92.2%) were obese. The BMI has 77.7% (83/83+24) sensitivity and 55.5% (5/5+4) specificity to detect central obesity. The positive predictive value was 95.4% (83/83+4) while the negative predictive value was 17.2% (5/24+5). In our study, 83.7% of actually overweight population lied in alert line (Figure 1) and 43.7% of actually obese population lied in action line (Figure 2).

Conclusion: Even though BMI is a simple tool in detecting overweight and obesity, it is not sufficient to detect central adiposity. WC percentile and WHtR are better tools for detecting central adiposity.