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Hypertension and its association with anthropometric indexes among pre-university students

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Abstract: Hypertension has become increasingly common among adolescents. This study aimed to investigate the prevalence of hypertension and its association with anthropometric indexes among pre-university students. This was a cross-sectional study carried out among pre-university students of a public university. Anthropometric measurements were conducted using mobile stadiometers, digital body fat scales and measuring tapes. Body fat percentage was measured with a body composition analyzer, and blood pressure was determined using digital blood pressure monitors. Statistical analyses were done using Statistical Package for Social Sciences (SPSS) Statistics 20. A total of 218 respondents participated in the study. The prevalence of hypertension at risk was 7.3%, which was higher among males (16.7%). About 22% of the respondents were overweight and obese. The majority of males had a normal waist circumference (WC) (75.9%), but almost half of females had a WC value in the unhealthy category (47.0%). Females had higher conicity indexes and body fat compared to males. Respondents who were found to have hypertension at risk had a higher prevalence of being overweight and having unhealthy WC and waist-to-height ratio and had high conicity indexes and a high percentage of fat. Risk factors independently associated with hypertension

at risk included male gender (odds ratio=4.213, 95% CI, 1.238–14.342) and body mass index (odds ratio=7.865, 95% CI, 1.165–53.099). Regular screening of hypertension at risk among adolescents and initiation of early treatment for those affected should be conducted to avoid further complication in later life.

Keywords: adolescent; body fat; body mass index; conicity; index hypertension; waist circumference.

Introduction

Based on the latest estimation, there are approximately 4.8 million Malaysians with hypertension (1). Results of the National Health and Morbidity Surveys (NHMS) in 2006 and 2011 revealed an increase in the prevalence of hypertension in Malaysian adults more than 18 years old from 32.2% in 2006 to 32.7% in 2011 (2). This health issue not only affects adults but has become increasingly common among adolescents (3). Local studies report that the prevalence of hypertension in adolescence is between 11.6% and 33.1% (4, 5). Hypertension in adolescence if not controlled can persist into adulthood, leading to adverse health outcomes including cardiovascular diseases such as atherosclerosis, coronary artery diseases, cerebrovascular diseases and left ventricular hypertrophy (6–8).

The relationship between hypertension and anthropometric indicators is evident. Overweight and obesity are related to an elevated systolic and diastolic blood pressure in adolescents. A study by Schiel et al. (9) demonstrated that the blood pressure of overweight and obese children was significantly higher than that of normal children. Thus, being overweight or obese puts children and adolescents at risk of developing hypertension. Significant association was also found in another study between blood pressure and body mass index (BMI) among adolescents, suggesting obesity is a strong risk factor for developing childhood hypertension (10). The study further emphasized that obese adolescents have higher ambulatory

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