

A09 Sex differences in body composition and muscle-bone unit of preadolescent children aged between 9-11 years old in Malaysia: A secondary analysis of PREBONE-Kids study

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Childhood is a critical period for bone growth. The close relationship between muscles and bones formed a functional unit which is known as the muscle-bone unit (MBU) and a measure of bone strength. Limited studies have examined the association between body composition and MBU in Malaysian preadolescent children. The main objective of this secondary analysis is to compare the sex differences in total body (TB), and regional (arm, leg, trunk, android, and gynoid) body composition, and MBU of preadolescent children aged between 9-11 years old. Baseline body composition, bone mineral content (BMC) and bone mineral density (BMD) were derived from the Dual energy X-ray absorptiometry scan reports. Total and regional MBU were calculated by dividing BMC with lean mass (LM). This study found that the BMD [BMD boys: 0.772(0.100) g/cm² vs BMD girls: 0.748(0.089) g/cm²; $p=0.004$], and BMC were higher in boys [BMC boys: 1153.3(336.8) g vs BMC girls: 1079.1(313.7) g; $p=0.037$]. Boys had higher LM compared to girls [boys: 21313.0(6566.0) g vs girls: 20397(7390.0) g; $p=0.043$]. Girls had higher body fat percentage than boys [girls: 29.1(12.2) % vs boys: 25.3(15.3) %; $p=0.004$] and the adipose distribution was different in the gynoid region [boys: 1146.0(1533.0) g vs girls: 1624.0(1221.0) g; $p=0.013$]. Girls had higher MBU in the arms [girls: 0.065(0.012) vs boys: 0.059(0.008); $p<0.001$], legs [girls: 0.055(0.007) vs boys: 0.053(0.007); $p=0.011$], and android [girls: 0.013(0.003) vs boys: 0.012(0.002); $p<0.001$]. This study showed that body composition and MBU sexual dimorphism were present in children aged 9-11 years. The differences are possibly influenced by pubertal hormones and varied physical activity levels. This study provides reference data for Malaysian children and is important to further understand the bone health status of growing children.