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Comparison of Cardiometabolic Risk Factors in Lean Versus Overweight/Obese Peri-Urban Female Adolescent School Learners in Mthatha, South Africa: A Pilot Case Control Study

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Abstract : Background: Childhood and adolescent obesity is an important predictor of adult cardiometabolic diseases. Current data on age- and gender-specific cardiometabolic risk factors are lacking in the peri-urban Eastern Cape Province, South Africa. However, such information is important in designing innovative strategies to promote healthy living among children and adolescents. The purpose of this pilot study was to compare and determine the extent of cardiometabolic risk factors between samples of lean and overweight/obese adolescent population in a peri-urban township of South Africa. Methods: In this case-control study, age-matched, non-pregnant and non-lactating female adolescents consisting of equal number of cases (50 overweight/obese) and control (50 lean) participated in the study. Fasting venous blood samples were obtained for total cholesterol (TC), low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), triglyceride (Trig), highly sensitive C-reactive protein (hsCRP) and blood sugar. Anthropometric measurements included weight, height, waist and hip circumferences. Body mass index was calculated. Blood pressure was measured; and metabolic syndrome was assessed using appropriate diagnostic criteria for children and adolescents. Results: Of the 76 participants with complete data, 12/38 of the overweight/obese and 1/38 of the lean group met the criteria for adolescent metabolic syndrome. All cardiometabolic risk factors were elevated in the overweight/obese group compared with the lean group: low HDL-C (RR = 2.21), elevated TC (RR = 1.23), elevated LDL-C (RR = 1.42), elevated Trig (RR = 1.73), and elevated hsCRP (RR = 1.9). There were significant atherosclerotic indices among the overweight/obese group compared with the lean group: TC/HDL and LDL/HDL (2.99±0.91 vs 2.63±0.48; p=0.016 and 1.73±0.61 vs 1.41±0.46; p= 0.014, respectively). Conclusion: There are multiple cardiometabolic risk factors among the overweight/obese female adolescent group compared with lean adolescent group in the study. Female adolescent who are overweight and obese have higher relative risks of developing cardiometabolic diseases compared with their lean counterparts in the peri-urban Mthatha, South Africa. School health programme focusing on promoting physical exercise, healthy eating and keeping appropriate weight are needed in the country.

Keywords : adolescents, cardiometabolic risk factors, obesity, peri-urban South Africa
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