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## Original Article

## Differences between Metabolically Healthy vs Unhealthy Obese Children and Adolescents

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## Abstract

Obesity is on the rise worldwide. An obesity subtype, metabolically healthy obese (MHO), is resilient to unfavorable metabolic and cardiovascular effects. Factors predicting MHO phenotype are not well characterized. We aimed to identify MHO and metabolically unhealthy obese (MUO) children and adolescents with respect to metabolic factors, and to find predictors of MHO subtype. A retrospective chart review was done on children, ages 4–19 years, 99% African–American/Caribbean, with BMI  $\geq 95^{\text{th}}$  %tile. MUO was defined as meeting  $\geq 1$  of the following: fasting glucose  $\geq 100$  mg/dl, HbA1c  $> 5.6\%$ , BP  $\geq 90^{\text{th}}$  %tile, TG  $\geq 150$  mg/dl, or HDL  $< 40$  mg/dl. Study included 189 subjects, 37.6% were MHO and 62.4% MUO. MHO subjects were younger (mean  $\pm$  SD,  $11.6 \pm 3.3$  vs  $12.9 \pm 3.2$  years;  $p < 0.009$ ) and had lower BMI %tile ( $98.4 \pm 1.4$  vs  $98.8 \pm 2.1$ ;  $p < 0.04$ ), smaller waist ( $94.2 \pm 15.2$  vs  $101.4 \pm 17$  cm;  $p < 0.003$ ) and hip circumferences ( $105.3 \pm 15.6$  vs  $113.5 \pm 15.4$  cm;  $p < 0.001$ ), lower fasting insulin ( $18.5 \pm 10.2$  vs  $24.2 \pm 14.3$   $\mu\text{U/ml}$ ;  $p < 0.022$ ), and lower HOMA-IR ( $4.1 \pm 2.4$  vs  $5.5 \pm 3.6$ ;  $p < 0.022$ ). Acanthosis nigricans was noted less frequently in MHO than MUO ( $p < 0.005$ ). In stepwise logistic regression, age and BMI %tile were significant predictors of MHO. We found that 38% of obese children are MHO. They are younger and have lower BMI %tiles. Lifestyle modification initiated at an early age may prevent metabolic abnormalities.

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## Keywords

Obesity; Metabolically healthy; Metabolically unhealthy; Children; Adolescents

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