The aim of this prospective study was to evaluate the utility of new biochemical markers to assess cardiometabolic risk in severely obese children and adolescents. A total of 107 subjects aged 7 to 14 years, were clinically assessed and anthropometric measures and percentage of fat mass by single frequency bioimpedance analysis were recorded. Of these, 44 were non-overweight and 63 severely obese (body mass index Z-score >2.5) which were stratified by Tanner stages. To estimate the metabolic risk the following variables were considered for analysis: Waist circumference/height >0.5, fasting glucose >100 mg/dL, triglycerides >110 mg/dL, HDL-C <40 mg/dL, and systolic or diastolic blood pressure >95th percentile for age and gender. Fasting insulinemia, apoprotein A1 and B, high-sensitive C-reactive protein, alanine aminotransferase, homocysteine, and folic and uric acids were determined. In severely obese children, metabolic risk was present more frequently in mid puberty. The normalized anthropometric parameters with respect to 50th percentile for age and gender did not differ in the presence of metabolic risk. Insulin resistance was an independent determinant of metabolic risk, adjusted by Tanner stages. Elevated high-sensitive C-reactive protein was noted without any effect of metabolic risk or pubertal stage. Homocysteine, apoprotein B, and alanine aminotransferase values increased with metabolic risk and were not influenced by puberty. Although insulin resistance remains the main factor influencing metabolic risk, biochemical markers as homocysteine, apoprotein B, and alanine aminotransferase, may be useful for identifying severe obese pubertal subjects particularly prone to comorbidities.

Keywords
Alanine aminotransferase, Apoprotein B, Homocysteine, Metabolic syndrome, Puberty.