Metabolic syndrome and insulin resistance: Can they be predicted by clinical indicators in obese prepubertal children?

E.Vlachopadopoulou1, I. Dikaiakou1, V. Petrou1, E. Anagnostou1, F. Karachaliou1, I. Patiniotis2, A. Fotiou2, S. Michalacos1

1. Dept. of Endocrinology-Growth and Development, Children’s Hospital P. & A. Kyriakou, Athens, Greece
2. Biochemistry Dept.-Hormones Laboratory, Children’s Hospital P. & A. Kyriakou, Athens, Greece

AIM

To evaluate whether anthropometric indices and acanthosis nigricans can be useful markers for early detection of Insulin Resistance and Metabolic Syndrome (MetS) in overweight and obese children.

METHODS

Data from 510 prepubertal children (40% boys), 12.9% overweight and 87.1% obese with mean age 9.7 ±2.5 years were analyzed. Logistic regression analysis was used to investigate which factors were associated with HOMA-IR >3 and metabolic syndrome.

RESULTS

• MetS was found in 12.9% of the children.
• HOMA-IR >3, was found in 14.3% of overweight and 39.8% of obese children.
• Among children with MetS, 50% had HOMA-IR >3 and they were all obese.
• The mean Body Mass Index (BMI) was greater in children with HOMA-IR >3 (29.3±3.1 vs. 26.1±3.1, p<0.001) (OR:1.31, 1.20-1.44).
• Also, children with HOMA-IR >3 had greater waist circumference (mean±SD: 94.7±9.6 vs. 85.6±10.4, p<0.001).
• Acanthosis Nigricans (ORA=2.42, 95% CI: 1.23 – 4.79, p=0.011) and increased % fat (ORA=1.14, 95% CI: 1.05 – 1.25, p=0.003) were associated with greater likelihood for HOMA-IR >3.
• Waist-to-height (WHtR) was associated with greater odds for HOMA-IR >3 (ORA=1.07, 95% CI: 1.02 – 1.18, p=0.013).
• Increased WHtR tended to be associated with the presence of MetS (ORA=1.07, 95% CI: 0.99 – 1.16, p=0.100), while for one unit increase in BMI the likelihood for MetS was found to increase about 16% (p=0.001).

CONCLUSION

The severity of obesity as evidenced by BMI, the presence of waist circumference to height ratio higher than 0.5, as well as the presence of acanthosis nigricans are clinical indicators of increased metabolic risk. Children at increased risk should be followed closely and have a more intense program of healthy diet and increased physical activity.