ASSOCIATION OF SERUM FIBROBLAST GROWTH FACTOR 21 AND IRISIN WITH INSULIN SENSITIVITY MARKERS AND SERUM LIPIDS IN 12-YEAR-OLD CHILDREN

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The authors have nothing to disclose

BACKGROUND
Among other cytokines, the hepatokine fibroblast growth factor 21 (FGF21) and the myokine irisin have been considered potential biomarkers for insulin sensitivity (IS). In adult studies, both of them have been found elevated in insulin resistant states.

OBJECTIVE AND HYPOTHESES
Our aim was to study whether serum FGF21 and irisin associate with markers of IS and serum lipids in 12-year-old children.

METHODS
A total of 192 children (109 girls) were studied at the mean age of 12.25 years (range 12.01-12.73). Seventy eight of them had been born appropriate for gestational age (AGA), 70 small for gestational age (SGA), and 44 from preeclamptic (PRE) pregnancies as AGA (Table 1). Fasting serum FGF21, irisin, insulin, HDL cholesterol (HDL-C), triglycerides (TG), high-sensitivity (hs)-CRP, gamma-glutamyltransferase (GGT) and leptin were measured. IS was estimated by Quantitative Insulin Sensitivity Check Index (QUICKI).

RESULTS
The means of serum FGF21 and irisin did not differ between the sexes or between the children born SGA, AGA or from PRE pregnancies (p=0.05 for all). In the whole study population, serum FGF21 had a positive association with irisin (beta=0.630, p=0.001) and negative associations with leptin (beta=-0.262, p=0.024) and HDL-C (beta=-0.602, p=0.043) [general linear model (GLM) analysis adjusted for sex, pubertal developmental stage, age- and sex-adjusted BMI, birth weight SDS and maternal PRE pregnancy history] (Table 2). Apart from FGF21, serum irisin associated positively with insulin (beta=0.341, p<0.001), hs-CRP (beta=0.072, p=0.003), GGT (beta=0.536, p=0.003) and TG (beta=0.154, p=0.041), and negatively with QUICKI (beta=-2.516, p=0.001) (Table 2). In a ROC curve analysis, irisin was able to weakly discriminate the children in the lowest QUICKI tertile [area under the ROC curve (AUC) 0.624 (95% CI 0.541-0.708), p=0.005], whereas neither irisin nor FGF21 could identify the children with the highest TG/HDL-C ratio.

CONCLUSION
In 12-year-old children, serum irisin was associated with triglycerides and markers reflecting reduced IS, whereas FGF21 was associated negatively with HDL-C and leptin independently of BMI. In ROC curve analyses, irisin could weakly distinguish the children with the lowest IS, whereas neither irisin nor FGF21 could detect the children with markers of dyslipidemia.