Correlation of serum fibroblast growth factor 21 (FGF-21) levels with metabolic parameters in Korean obese children

Joon-Woo Baek¹, MD, Hyo-Kyong Nam², MD, PhD, Young-Jun Rhee², MD, PhD, Kee-Hyong Lee³, MD, PhD.

Department of Pediatrics, Choonse Sacred Hospital, College of Medicine, Hallym University, Choonse, Korea
¹ Department of Pediatrics, Korea University College of Medicine, Seoul, Korea
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Introduction

• Serum FGF-21, a potential biomarker, for early detection of the metabolic syndrome (MetS) and type 2 diabetes in adults.
• A few studies about the correlation between FGF-21 levels and metabolic parameters in children.

Objectives

This study is aimed to evaluate the relationship between FGF-21 & metabolic parameters in obese children.

Subjects and Methods

Subjects
78 obese Korean children and 37 lean children
None of children in the study suffered from any other disorder or medication known to affect the serum FGF21.

Method
• BMI was calculated as Wt(kg)/H(m²)
• Reference data for 2007 Korean children were used.
• We analyzed fasting serum FGF-21, adiponectin by enzyme-linked immunosorbent assays and also fasting glucose, insulin, transaminases, lipid profile were measured by standard enzymatic methods.

Statistical analyses
• Analyses were performed using IBM SPSS version 22.0 (IBM Co., Armonk, NY, USA).

Results

• Serum FGF-21 were significantly increased in the obese children compared to those of normal-weight children.
• Obese children demonstrated significantly increased insulin, total cholesterol, LDL-C, triglycerides, liver transaminase(AST, ALT).
• Serum adiponectin and HDL-C were significantly decreased in obese children than in controls.

• Serum FGF21 levels were positively correlated with insulin (r=0.341, p<0.001), triglycerides (r=0.451, p<0.001) and ALT (r=0.285, p<0.002). But serum FGF21 levels were negatively correlated with HDL-C (r=-0.341, p<0.001).
• After multivariate analysis checking among explanatory variables (BMI, Triglyceride, HDL-cholesterol, fasting insulin, ALT), a multivariate analysis using multiple linear regression revealed fasting insulin levels were only independently and significantly correlated with serum FGF21 levels

Conclusions

Serum FGF21 was higher in obese children and significantly correlated with metabolic parameters. Our results suggest that FGF-21 may be potentially used as early biomarker for obese children with metabolic disorders.