Serum Fibroblast Growth Factor 23 And Klotho Concentrations In Children And Adolescents With Obesity

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INTRODUCTION

Obesity in childhood and adolescence represents one of the main health problems of the 21st century. Fibroblast Growth Factor 23 (FGF-23) and its co-receptor, Klotho, play an important role in mineral metabolism. However, little is known about their role in obesity.

AIM

Our aim was to determine the concentrations of FGF-23 and Klotho in children and adolescents with overweight and obesity.

METHOD

Three hundred and twenty subjects (163 males (50.9%), 157 females (49.1%), 158 prepubertal (49.4%), 162 pubertal (50.6%), aged [mean ± standard deviation (SD)] 10.5 ± 2.8 years, were studied prospectively for one year. Subjects were classified as obese (n=211, 66%), overweight (n=99, 30.9%) and of normal BMI (n=10, 3.1%) and were enrolled in a one-year lifestyle intervention program of diet and physical exercise. Body composition and biochemical and endocrinologic parameters were determined at the beginning and at the end of the study. The study was approved by the Committee on the Ethics of Human Research, and written informed consent was obtained from the participants and the staff of the Out-patient Clinic for the Prevention and Management of Overweight and Obesity.

RESULTS

- Significant decrease in BMI (p=0.001), total cholesterol (p=0.001), LDL (p=0.001), HBA1C (p=0.021) and FGF-23 (p=0.004) concentrations, and percentage of body fat (p=0.001).
- Significant increase in HDL (p=0.001), parathormone (PTH) (p=0.001), 25-OH-Vitamin D (VIII D) (p=0.003), adiponectin (p=0.001) and Klotho (p=0.001) concentrations, and percentage of muscle mass (PMM) (p=0.001).
- Klotho concentrations correlated negatively with the waist-to-hip ratio (p=0.001) and VIII D (p=0.022), and positively with PTH (p=0.050).
- The change in FGF-23 concentrations correlated positively with the change of Apolipoprotein1 (Apo1) (r=0.200, p=0.001).
- The change in Klotho concentrations correlated positively with the change in BMI (r=0.169, p=0.009), diastolic blood pressure (r=0.267, p=0.022), waist circumference (r=0.319, p=0.001), Apo1 (r=0.171, p=0.011), HOMA-IR (r=0.259, p=0.001), PMM (r=0.226, p=0.004) and adiponectin (r=0.215, p=0.002).
- The change in BMI correlated positively with Klotho change in males (r=0.438, p=0.001).
- The change in BMI correlated positively with the change in FGF-23 (r=0.364, p=0.023) and Klotho (r=0.462, p=0.001) concentrations in subjects that entered puberty.
- Participants had normal kidney function.

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