

Relationship between glucose and lipid metabolism, inflammatory factors and adipokines in children with obesity

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Objective

To investigate the co-relationship among glucolipid metabolism and inflammation, adipokines in obese and normal weight children.

Methods

Children aged 5 to 15 year-old were collected. Fasting venous blood samples were collected to test liver function, triglyceride (TG), total cholesterol (TC), high density lipoprotein cholesterol (HDL), low-density lipoprotein cholesterol (LDL), fasting plasma glucose (FPG) and insulin. The inflammatory markers interleukin-6 (IL-6) and tumor necrosis factor alpha (TNF α), and adipokines including leptin and glucagon-like peptide 2 (GLP-2) levels were detected by ELISA.

Results

A total of 40 obese children (22 males, 18 females, 9.81 ± 1.83 year-old) and 29 gender- and age-matched normal weight children as controls (13 males, 16 females, 8.98 ± 1.98 year-old) were enrolled. The ALT, TG, LDL, homeostasis model insulin resistance index (HOMA-IR), IL-6, TNF α , leptin and GLP-2 were significantly higher in obese group, and HDL levels were significantly lower compared with the control group ($p < 0.05$). There were no significant differences in TC, AST and FPG levels between the two groups ($p > 0.05$). The IL-6 level was positively correlated with WHR ($p < 0.05$); the TNF α level was positively correlated with WHR, BMI, TG, FBG and HOMA-IR. Both IL-6 and TNF α levels were negatively correlated with HDL ($p < 0.05$). The GLP2 level was positively correlated with WHR and BMI ($p < 0.05$), but had no significant correlation with glycolipid index ($p > 0.05$); Leptin was positively correlated with BMI, TG, LDL and HOMA-IR, and negatively correlated with HDL ($p < 0.05$). TNF α was positively correlated with leptin ($p < 0.05$); GLP-2 level was positively correlated with leptin ($p < 0.05$).

Conclusion

Obese children are in a state of chronic low-grade inflammation. TNF α level were increased with BMI, and may participate in the course of insulin resistance; IL-6 may be associated with abdominal obesity and involved in lipid metabolism. GLP-2 was associated with leptin, and the interaction mechanism between the two adipokines are still needed further studies.

