Abstract

Obesity and Type 2 diabetes mellitus share a strong pro-inflammatory profile. It has been observed that iron is a risk factor in the development of type 2 diabetes. The aim of this study was to evaluate the relationship between iron nutritional status and inflammation with the risk of type 2 diabetes development in obese subjects. We studied 30 obese men with type 2 diabetes (OBDM); 30 obese subjects without diabetes (OB) and 30 healthy subjects (Cn). We isolated peripheral mononuclear cells (PMCs) and challenged them with high Fe concentrations. Total mRNA was isolated and relative abundance of TNF-α, IL-6 and hepcidin were determined by qPCR. Iron status, biochemical, inflammatory and oxidative stress parameters were also characterized. OBDM and OB patients showed increased hsCRP levels compared to the Cn group. OBDM subjects showed higher levels of ferritin than the Cn group. TNF-α and IL-6 mRNA relative abundances were increased in OBDM PMCs treated with high/Fe. Hepcidin mRNA was increased with basal and high iron concentration. We found that the highest quartile of ferritin was associated with an increased risk of type 2 diabetes when it was adjusted to BMI and HOMA-IR; this association was independent of the inflammatory status. The highest level of hepcidin gene expression also showed a trend of increased risk of diabetes, however it was not significant. Levels of hsCRP over 2 mg/L showed a significant trend of increasing the risk of diabetes. In conclusion, iron may stimulate the expression of pro-inflammatory genes (TNF-α and IL-6), and both hepcidin and ferritin gene expression levels could be a risk factor for the development of type 2 diabetes. Subjects that have an increased cardiovascular risk also have a major risk to develop type 2 diabetes, which is independent of the BMI and insulin resistance state.

Keywords

Key words, Inflammatory cytokines, Iron, Hepcidin, Ferritin, Obesity.