ABSTRACT

Iron-related parameters in adipose tissue and blood in diabetes mellitus

Introduction:

Type 2 diabetes mellitus (T2DM) has been shown to be associated with increased body iron stores. The iron content in adipose tissue has been postulated to play a role in the pathogenesis of insulin resistance, a characteristic feature of T2DM.

Aim:

To study iron-related parameters in adipose tissue and blood in T2DM patients and to compare them with control subjects

Objectives

1. To determine mRNA expression of transferrin receptor 1 (TfR1) (the iron import protein) and ferroportin (the iron export protein) in subcutaneous and visceral adipose tissue in patients with T2DM and in control subjects.
2. To compare serum levels of iron, ferritin and transferrin saturation in patients with T2DM and control subjects.
3. To obtain anthropometric data of these patients and correlate these with the above parameters.
**Materials and Methods**

Patients who underwent elective abdominal surgery were the subjects of this study. Such patients were classified as diabetics or controls as per the American Diabetes Association 2015 criteria. Anthropometric data and blood samples were collected from the patients preoperatively. Blood was used to estimate various iron-related parameters. Samples of subcutaneous and visceral adipose tissue were collected at the time of surgery. These samples were used to determine gene expression of ferroportin and TfR1.

**Results**

Twenty three diabetics and 14 control subjects were studied. Blood parameters of iron status and body mass index were similar in both groups. TfR1 mRNA levels tended to be higher in the visceral adipose tissue of the diabetic group compared to controls (p value = 0.069). There was a significant correlation between TfR1 and ferroportin mRNA levels in the visceral adipose tissue of diabetics.

**Conclusion**

The observations of this study suggest that adipocytes in VAT from diabetics may be iron-depleted, as indicated by a trend for TfR1 mRNA levels to be higher in diabetics. This observation requires confirmation in an adequate sample size of patients.

**Keywords:** Type 2 diabetes mellitus, insulin resistance, adipose tissue, transferrin receptor 1, ferroportin