Expression and activity of 11?-hydroxysteroid dehydrogenase type 1 enzyme in subcutaneous and visceral adipose tissue of prepubertal children

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Background: Glucocorticoid excess promotes visceral obesity and cardiovascular disease. Ligand availability to the glucocorticoid receptor is controlled by isoforms of 11?-hydroxysteroid dehydrogenase (11?-HSD) which converts endogenous cortisone to active cortisol. Aim: To evaluate the expression and activity of 11?-HSD1 in subcutaneous adipose tissue (SC) and visceral adipose tissue (VAT) in prepubertal children with normal weight. Methods: Fourteen patients (11 female/3 male) with a mean age of 6.9 ± 0.9 years and a body mass index (BMI) of 17.4 ± 0.61 underwent elective open abdominal surgery. Results: Expression of 11?-HSD1 mRNA in SC and VAT was similar (0.8 ± 0.15 vs. 0.61 ± 0.12 AU). The activity of this enzyme in SC was significantly lower compared to VAT (1.42 ± 0.39 vs. 2.79 ± 0.61 ng cortisol/g tissue/24 h, $p < 0.05$). In addition, we observed a significant direct correlation with the expression of 11?-HSD1 in VAT adipose tissue with the patient's BMI ($r = 0.825$, $p = 0.002$).