

The association of dietary calcium intake and serum vitamin D with leptin and apelin gene expression from visceral and subcutaneous adipose tissue among adults

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Objective

The purpose of the study was to investigate the association of dietary calcium and vitamin D levels with leptin and apelin gene expression in visceral (VAT) and subcutaneous (SAT) adipose tissues in adults.

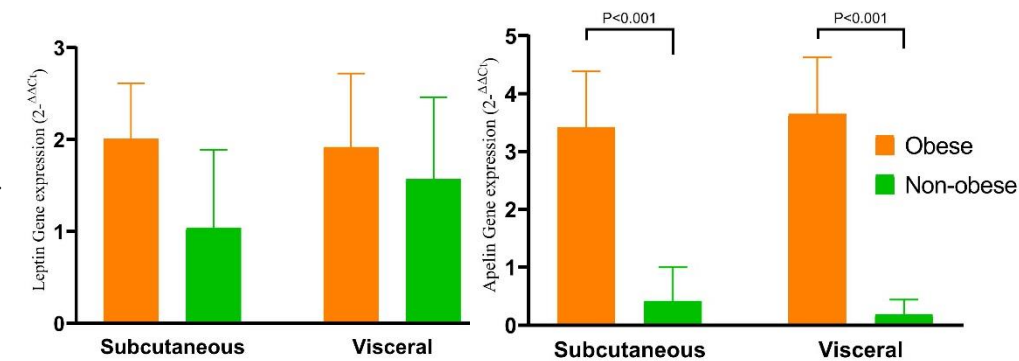
Method

This cross-sectional study was conducted on 91 participants, aged ≥ 20 years, who underwent an elective abdominal surgery with minimal impact on dietary intake. VAT and SAT were obtained during the surgery. Before the surgery, dietary calcium intakes were collected using a valid and reliable food-frequency questionnaire, and fasting blood samples were gathered. Then the 25(OH)vitamin D concentration was measured using the electrochemiluminescence assay. The leptin and apelin gene expression in VAT and SAT was measured by Real-Time PCR.

Results

After adjustment for BMI, total energy intake, and age, VAT apelin gene expression was associated with calcium intake ($\beta=-0.571$, $P=0.014$) and vitamin D concentrations ($\beta=-0.314$, $P=0.034$) in the total population. Among non-obese participants, calcium intake was associated with VAT apelin ($\beta=-0.617$, $p=0.008$) and leptin ($\beta=0.417$, $P=0.018$) gene expression. Leptin gene expression in SAT was associated with serum vitamin D ($\beta=-0.481$, $P=0.016$) among obese participants. Moreover, among obese participants, we found a significant association between VAT leptin mRNA expression and serum vitamin D ($\beta=-0.353$, $P=0.40$).

Figure: Apelin gene expression was more increased in obese than non-obese participants in VAT and SAT; however, the leptin mRNA levels was equal.



Conclusions

Dietary intake of calcium and serum vitamin D were inversely associated with leptin and apelin gene expression in visceral and subcutaneous adipose tissue independent of body mass index.