SUMMARY

Objective: Insulin resistance is described as reduced sensitivity of the body tissues to insulin. In pregnant women insulin resistance increases during each trimester of pregnancy due to the hormones produced by the placenta and many other factors which are not yet fully recognised. Growing insulin resistance leads to an increase in beta cell mass and number and insulin secretion, which helps to maintain glucose homeostasis and normal foetal development. Evidence in support of an association between betatrophin and insulin resistance (IR) is mounting, with studies demonstrating betatrophin is elevated in patients with type 2 diabetes, obesity and gestational diabetes.

Aim: The aim of the study was to evaluate the relationship between betatrophin concentration and IR, and lipid and thyroid hormone levels in healthy women in each trimester of pregnancy and after delivery.

Methods: Eighty healthy pregnant women were examined in each trimester [T1 (first), T2 (second), T3 (third)], with a subgroup (n=45) that was also examined at 3 months postpartum (3MPP). The controls comprised 30 non-pregnant healthy women (HW) of reproductive age. We measured the levels of betatrophin (ELISA), glucose (enzymatic method with hexokinase), insulin (IRMA), C-peptide (EASIA), HbA1c (HPLC), while HOMA-IR and HOMA%β scores were calculated.

Results: Betatrophin concentration was highest at T1 and differed significantly from T2 and T3 [1.84 (Q1=1.16, Q3=2.67) ng/ml vs 1.46 (Q1=0.96, Q3=2.21) ng/ml, $P<0.05$, and 1.23 (Q1=0.85, Q3=2.14) ng/ml, $P<0.01$, respectively]. The T3 median concentration of betatrophin was the lowest of all trimesters, and significantly lower than at 3MPP [1.23 (Q1=0.85, Q3=2.14) ng/ml vs1.49 (Q1=1.06, Q3=2.60) ng/ml, $P<0.01$, respectively]. At 3MPP, the level of betatrophin was similar to that of HW [1.47 (Q1=0.89, Q3=2.67) ng/ml]. HOMA-IR and HOMA%β index scores increased during gestation, peaking at T3 [2.3(Q1=1.66, Q3=2.72) and 227.7 (Q1=185.49, Q3=326.31), respectively] and returning to levels similar to those of HW at 3MPP [1.53 (Q1=1.12, Q3=2.41) and 88.86 (Q1=62.73, Q3=130.45) vs 1.35 (Q1=1.02, Q3=1.62) and 92.5 (Q1=74.20, Q3=111.47), respectively].

Conclusion: Concentration of betatrophin decrease during pregnancy, suggesting that the hormone does not play a significant role in the expansion of the beta cell mass and IR during pregnancy.