**Effects of fertility medications on glucose homeostasis and other metabolic parameters in women undergoing in vitro fertilization (IVF)**

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**Keywords**

Infertility, IVF pregnancy outcome, glucose homeostasis, glucose intolerance, insulin resistance and pregnancy, pregnancy diabetogenic effect

**Rationale:** Obesity has increased along with increasing obesity-related abnormalities in the reproductive system, which include anovulation and infertility. Infertility is defined as inability to conceive for twelve months of unprotected intercourse; as a consequence, in vitro fertilization (IVF) treatment has become more common. In mice, IVF was associated with glucose intolerance. Controversies still exist on whether IVF related hormones would be an additional factor to the known diabetogenic effect of pregnancy predisposing women to adverse obstetric outcomes compared to spontaneously-conceived pregnancy.

**Objective:** To assess the effect of IVF medications on glucose homeostasis and other cardio-metabolic parameters (lipid profile and thyroid function).

**Methodology:** Adult non-diabetic women (BMI: 18.5 – 37 kg/m2 and age ≤ 39 years) undergoing IVF treatment were recruited (n=96). Blood samples were collected throughout the IVF treatment: baseline, egg retrieval, 4 weeks of IVF hormonal administration and 12 weeks of pregnancy. Changes in glucose homeostasis and insulin sensitivity (using HOMA-IR) were determined with both plasma insulin and glucose. Lipid profile, HbA1c, thyroid-stimulating hormone (TSH) and women reproductive hormones were also routinely measured.

**Results:** At 12 weeks of IVF hormonal intervention, glucose level significantly increased for non-pregnant women (7%). The pregnant group demonstrated 6% decrease in glucose and 55% in TSH levels; and 76%, 10% and 20% increase in triglycerides, total and HDL-cholesterol respectively. However, all values remain within the normal range.

**Conclusion:** The observed changes in metabolic parameters are more likely associated with the normal physiological effect of pregnancy rather than the IVF treatment. Fertility medications have an impact on glucose homeostasis; however, this effect seems to be overcome with pregnancy. This novel finding raises some concerns on the long-term effect of hormonal therapy on glucose homeostasis in a non-pregnancy setting. The mechanism accounting for the difference in glucose homeostasis in relation to pregnancy status remains to be determined.