

ROLE OF HOMEOSTASIS MODEL ASSESSMENT FOR INSULIN RESISTANCE (HOMA-IR) IN REPRODUCTIVE MEDICINE

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Background:

Insulin resistance (IR) is a potential contributor to impaired treatment outcome in artificial reproductive technology (ART). In this context, the Homeostasis Model Assessment for insulin resistance (HOMA-IR) has gained importance to evaluate glucose and insulin metabolism. The association of HOMA-IR with fertility treatment parameters still remains a black box in reproductive medicine research.

Methods:

The study included 175 patients (25 men and 150 women), aged 18-45. HOMA-IR was determined by taking a blood sample during fasting state and measuring the values of glucose (mg/dl) and insulin (μ U/ml). A HOMA-IR of ≥ 2 was considered as insulin resistance. HOMA-IR was correlated with medical history (polycystic ovarian syndrome (PCOS), endometriosis, Body-Mass-Index (BMI), nicotine abuse) and fertility treatment parameters (sperm quality, number of retrieved oocytes after controlled ovarian stimulation, number of mature and fertilized oocytes, embryo quality and pregnancy rate).

Results:

An increased HOMA-IR (≥ 2) was observed in 90 patients (51.4%). They suffered from obesity (n=36; 80%), PCOS (n=22; 70.97%), ovarian hyperstimulation syndrome (n= 17; 77.27%) and experienced poor embryo quality (n=249; 91.54%). A significant positive correlation was found between HOMA-IR and PCOS ($p < 0.001$), obesity ($p < 0.001$) and number of retrieved oocytes ($p < 0.05$). The pregnancy rate correlated negatively with the HOMA-IR ($p < 0.001$). Furthermore, trends of positive correlations of high HOMA-IR in endometriosis, BMI, pathological spermogram, nicotine abuse and increased number of mature oocytes were determined.

Conclusions:

The data show that HOMA-IR is associated with fertility treatment parameters and has a significant influence on ART outcome. These findings may help to better understand the importance of glucose and insulin metabolism in reproduction and suggests that evaluation of HOMA-IR may be a substantial contribution in medical history prior to starting ART treatment.

Conflict of interest:

none