

Abstract

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Evaluation of the relationship between follicular fluid oxidative stress, ovarian hormones, and response to gonadotropin stimulation.

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OBJECTIVE: To investigate the relationship between oxidative stress and the underlying causes of infertility, preovulatory ovarian hormones, and ovarian response to gonadotropin stimulation in patients undergoing assisted reproductive techniques.

DESIGN: Prospective, cross-sectional study.

SETTING: Assisted conception unit, university hospital.

PATIENTS: One hundred thirty women presenting with infertility, of the following types: male factor (n = 56), unexplained (n = 36), tubal factor (n = 16), polycystic ovary syndrome (n = 15), and endometriosis (n = 7).

INTERVENTION: Follicular fluid (FF) and peripheral blood samples were collected at oocyte retrieval.

MAIN OUTCOME MEASURE: Blood and FF samples were analyzed for inhibin A, inhibin B, activin A, anti-Müllerian hormone, and E(2) by using ELISA. Total antioxidant capacity (TAC) was measured in plasma and FF by using a calorimetric microplate assay.

RESULT: There was no significant relationship between plasma or FF TAC and the underlying etiology of infertility. There was a statistically significant positive association between FF E(2) levels and TAC ($r = 0.26$). Higher antral follicle count, delta E(2) (day 3 E(2) minus day 2 E(2)), preovulatory serum anti-Müllerian hormone, inhibin B, and E(2) were associated with good ovarian response, whereas higher FF E(2) was associated with a statistically significant poor response. No significant direct relationship was observed between TAC and ovarian response as well as between TAC or any of the parameters measured and pregnancy outcome.

CONCLUSION: Oxidative stress has an impact on the production of granulosa cell steroid hormones, in particular E(2), which is an important predictor of ovarian response. The positive association between FF E(2) and total antioxidant capacity suggests that E(2) may play a role in the ovarian antioxidant-oxidant balance.

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