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Are gene polymorphisms and AMH level good predictors of poor ovarian response in Egyptian women undergoing ICSI cycles?

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Background: *In vitro* fertilization (IVF) is highly challenged by the erratic individual variability to controlled ovarian hyperstimulation (COH). This study aimed at implementing the role of pharmacogenetics in predicting the stimulation success and thus tailoring the treatment reaching advancement in patient care. The follicle stimulating hormone receptor (FSHR) and the estrogen receptors (ERs) are important genes in explaining the variability in COH results.

Methods: We performed a prospective study on 216 young women with unexplained infertility. Ovarian stimulation was performed according to the GnRH antagonist protocol with a fixed daily morning dose of human menopausal gonadotropin (HMG) [Merional[®] 75 IU ampoules, IBSA institute] intra-muscular injection starting on cycle day 2. Based on the patient's body mass index and hormonal profile, the daily dose of HMG was adjusted. The ESR2 (+1730G>A) (rs4986938), FSHR p.Thr307Ala (c.919A>G, rs6165) and FSHR p.Asn680Ser (c.2039A>G, rs6166) single nucleotide polymorphisms (SNPs) were detected by real-time polymerase chain reaction (RT-PCR). Serum FSH, estradiol (E2) and Anti-Müllerian Hormone (AMH) levels were measured by Enzyme-Linked Immunosorbent Assay (ELISA).

Results: This study revealed that the low AMH level was highly significantly related to the poor ovarian response ($p < 0.001$). Furthermore, the frequency of the ESR2 (AA) genotype and the FSHR (Ala³⁰⁷Ala), (Ser680Ser) genotypes were highly significantly associated with the poor ovarian response ($p < 0.001$). In the combined analysis of FSHR and ESR2 genes, the more specific haplotypes were (AAG) for good responders and (GGA) for poor responders.

Conclusion: The AMH level in combination with the ESR2 and the FSHR gene polymorphisms predict the poor ovarian response to COH in Egyptian women.

Biography

Tarek M K Motawi is Professor of Biochemistry at Faculty of Pharmacy, Cairo University. He received PhD in Pharmaceutical Sciences in 1984; MSc in Pharmaceutical Sciences in 1979 and BSc in Pharmaceutical Sciences from Faculty of Pharmacy, Cairo University in 1976. His professional experience include: Instructor (1976), Lecturer Assistant (1980), Lecturer (1984), Assistant Professor (1989), Professor (1994) and Head of the Department of Biochemistry, Faculty of Pharmacy, Cairo (2008-2014).

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