

The unpredictable ovarian response to gonadotropins among patients, ranging from poor response to ovarian hyperstimulation syndrome (OHSS) has been one of the most challenging problems in medically assisted reproduction (MAR).

The ovarian response to gonadotrophin stimulation is difficult to predict even in patients with similar endocrine profiles. This has led to the investigation of specific new biomarkers that could serve as predictors of ovarian response to an exogenous hormonal stimulation.

Recently, gene association studies have tried to identify a number of genetic variations influencing inter individual variability in COH.

The focus of many pharmacogenetic studies, have analyzed the relationship between selected SNPs in candidate hormonal receptor genes involved in folliculogenesis and ovarian response to COH. Among them, SNPs rs10407022 in gene AMH, rs3741664 in gene AMHR, rs1394205 and rs6166 in gene FSHR, and rs2234693 in gene ESR1 were the largely studied genes to date.

Each of the mentioned studies analyzed only single SNP or only several SNPs in the same gene.

Nevertheless, the most studied polymorphism FSHR Asn680Ser is practically the only genetic marker, together with ESR1 PvuII T/C, that could be applied in clinical tests.

Conclusions: Although data are accumulating with evidence suggesting that the ovarian response to COH is mediated by various polymorphisms, the optimal biomarkers and the efficacy of the tests still remain to be evaluated.