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Pratap Kumar
Kasturba Medical College, India

Serum anti mullerian hormone as a predictor of ovarian reserve and outcome in assisted reproductive technology

Objectives: To correlate serum anti mullerian hormone (AMH) levels with age, antral follicle count (AFC), number of follicles, oocytes obtained, quality of embryos and ART outcome and to compare AMH with day 2 serum Follicle stimulating hormone (FSH) in prediction of ovarian reserve.

Study design: This is a prospective observational study conducted over 84 women (<40 years old) undergoing IVF/ICSI cycle at the Centre for Human Reproduction, Kasturba Hospital, Manipal between August 2009 and August 2011. AMH, FSH and AFC measurements were made on day 2 of the cycle. A standard down-regulation long protocol using gonadotropin releasing (GnRH) agonist and recombinant follicle stimulating hormone or stimulation with exogenous gonadotropins with addition of a GnRH antagonist was used. Embryo transfer was done on day 3 following oocyte retrieval. Based on serum AMH range, the study group was divided into 3 groups: 1) Group I - <0.7 ng/ ml, 2) Group II - 0.7 - 3.5 ng/ ml, 3) Group III - >3.5 ng/ ml. Outcomes such as the number of mature oocytes and good quality embryos obtained and the pregnancy rate were compared between these three groups. Statistical analysis was done using Non parametric test (Kruskal Wallis) and Exact test. Receiver operating characteristic (ROC) curves were generated for AMH and FSH to compare the ability to predict the number of oocytes and the pregnancy.

Results: The median number of antral follicles, follicles retrieved and oocyted obtained were higher in AMH group III (>3.5 ng/ ml), whereas mature oocytes and good quality embryos obtained were higher in AMH group II (0.7-3.5 ng/ml). The occurrence of Ovarian Hyperstimulation Syndrome (OHSS) was higher (61%) in AMH group III, where it was 0% in AMH group I. As AMH value decreased, the median FSH value increased. Area under curve for prediction for prediction of number of oocytes was 0.790 for AMH and 0.591 for FSH. AMH performed better than FSH in predicting the number of oocytes. Both FSH and AMH were not good predictors of pregnancy.

Conclusion: Serum AMH accurately predicts ovarian reserve (Antral follicle count) and oocyte retrieval number in assisted reproductive technology. AMH is a better predictor of ovarian reserve than FSH. The optimal range of AMH to get good ovarian response is 0.7 - 3.5 ng/ml. AMH predicts the development of OHSS whereas AMH like FSH is a poor predictor of pregnancy.

Biography

Pratap Kumar is a Professor in Department of Obstetrics and Gynecology at Kasturba Medical College Manipal, India. He is also Head, Division of Reproductive Medicine at ManipalUniversity. He is the National Vice President of the Federation of Obstetrics and Gynecology for the year 1999. He has more than 250 publications and presented more than 500 presentations in national and international congresses.He is the President, Karnataka State Obs&GynSocieties of FOGSI [The Federation of Obstetrics & Gynecological Societies of India](2011-12) and also President, Manipal Branch of Obstetrics &Gynecology of FOGSI 2011-2012. He was awarded the FOGSI- Dr.Kutty Lifetime Achievement Award for 2011-12.

pratap.kumar@manipal.edu