

Quantification of ovarian Doppler signal in hyperresponders during in vitro fertilization treatment using three-dimensional power Doppler ultrasonography

Pan Hsien-An, Hung Kuei-Hsiang, Wu Li-Hsiang, Hsu Chi-Chuan, Chang Fong-Ming

Department of Obstetrics and Gynecology, National Cheng Kung University Hospital

INTRODUCTION: To test the hypothesis that the increased ovarian sensitivity to gonadotropins observed in women embarking on an in-vitro fertilization (IVF) treatment may be due to changes in ovarian stroma blood flow.

METHODS: Three-dimensional (3D) power Doppler ultrasonographic indexes were used to quantify ovarian blood flow and vascularization in hyperresponders. Fifty-eight patients undergoing an IVF cycle were recruited and divided into two groups, a hyperresponder group ($n = 23$) (peak estradiol > 3000 pg/ml or ≥ 15 oocytes retrieved) and normal responders ($n = 35$), base on their response to a standard down regulation protocol for controlled ovarian stimulation. During ovarian stimulation, on the day of human chorionic gonadotropin (HCG) administration, patients underwent hormonal (serum E2) and 3D power Doppler (ovarian stroma flow) evaluation.

RESULTS: The serum estradiol levels on the day of HCG administration, the number of oocytes retrieved and the ovarian volume were significantly higher in the hyperresponders than in the normal groups. The Vascularization Flow Index (VFI), Flow Index (FI), and Vascularization Index (VI), were significantly higher ($P < 0.05$) in the hyperresponders (1.24 ± 0.56 , 50.64 ± 2.24 , and 2.38 ± 0.99 , respectively), compared to the women with a normal response (0.54 ± 0.50 , 42.43 ± 7.55 , and 1.07 ± 0.99 , respectively).

CONCLUSIONS: This may help to explain the excessive response during gonadotropin administration in the hyperresponsive women undergoing IVF procedure.