

Serum estradiol level is not a predictor of live birth rates in hormone replacement therapy: a retrospective analysis

Selntigia Aikaterini^{a,d}, Molinaro Pietro^{a,c}, Massaro MariaGiulia^a, Mariani Giulia^a, Galliano Daniela^a, Pellicer Antonio^{a,b}, Cozzolino Mauro^{a,b}

^aIVIRMA Global Research Alliance, IVI Roma, Rome, Italy.

^bIVIRMA Global Research Alliance, IVI Foundation - Instituto de Investigación Sanitaria La Fe (IIS La Fe), Valencia, Spain.

^cUniversity of Valencia (UV), Valencia, Spain.

^dDepartment of Surgical Sciences, Obstetrics and Gynecological Unit, University of Rome "Tor Vergata", Italy



Introduction: Several studies have been unable to determine the ideal serum E2 level before P4 administration in the hormonal replacement therapy (HRT) cycle. Recently two retrospective study reported that live birth rates (LBRs) were significantly higher with peak follicular phase E2 levels of 300–500 pg/mL before exogenous P4 administration, compared with E2 levels above or below this range in a study population of single euploid blastocyst transfers. The studies show a significant association between serum E2 levels and reproductive outcomes in frozen embryo transfer (FET) with HRT in which optimal serum P4 levels were secured. Midluteal serum E2 levels are associated with the LBR in HRT-FET cycles

Objective: To evaluate whether serum estradiol (E2) levels are associated with the live birth rate in HRT embryo transfers.

Material and Methods: A total of 3269 single blastocyst transfers using HRT were included in the study. The HRT cycle priming regimen included oral E2 (6mg/day) administered, followed by vaginal P4 (400mg/12 h). Serum E2 and P4 levels were measured using a standardized method, the E2 was measured on the day of the endometrial thickness. Patients with serum P4 levels (<9.75 ng/mL) on the day of transfer received additional subcutaneous P4 (25mg/day). No additional E2 dose was administered

Results: The optimal serum E2 levels correlating with ongoing pregnancy were >207pg/mL. 1661 embryo transfers were included in the group with <207 pg/mL and 1608 were >207pg/mL. No statistical difference in the pregnancy rate was shown in the group with lower E2 58.74% (CI95% 56.30-61.15) than higher E2 61.35% (CI95% 58.90-63.76), p= 0.14. The clinical pregnancy rate was similar in the group with E2 <207pg/mL 52.06% (CI95% 49.60-54.52) than E2 >207pg/mL 55.57%(CI95% 53.08-58.04), p= 0.05 . The live birth rate was higher in the group with E2 >207pg/mL 39.52%(CI95% 36.92-42.16) than E2 <207pg/mL 38.46%(CI95%35.97-40.99) without statistically significance p= 0.58. No statistical difference in the groups was reported for the miscarriage rate. The multivariate analysis controlling for possible confounders showed that the serum E2 level does not influence the live birth rate OR 1.06 (CI95% 0.89-1.27), p= 0.32 and the miscarriage rate OR 0.96 (CI95% 0.74-1.24), p= 0.78

Conclusions: The study shows no correlation between serum E2 levels and reproductive outcomes in an HRT-FET cohort. Serum E2 levels seem not associated with the LBR in HRT-FET cycles. The search for the most optimal HRT protocol in assisted reproductive technology treatment continues.

