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The relationship of the serum progesterone level on the day of oocyte retrieval day and pregnancy outcome in vitro fertilization-embryo transfer

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Background: Several studies supported the notion that elevated progesterone levels at the time of human chorionic gonadotropin (hCG) trigger in vitro fertilization (IVF) with fresh embryo transfer negatively impact pregnancy rates. But few studies evaluate the relationship of progesterone levels on the day of oocyte retrieval day and pregnancy rates.

Aim: To evaluate whether the serum progesterone levels on the day of oocyte retrieval day affect the quality and quantity of viable embryos and impact pregnancy rates in women undergoing IVF with fresh embryo transfer.

Method: This study included 754 ovarian stimulation cycles (Long gonadotrophin-releasing hormone (GnRH) agonist protocol: 331 cycles, Antagonist protocol: 423 cycles) leading to fresh embryo transfer cycles between January 2014 and December 2016. Cycles were divided into 3 groups based on serum progesterone levels: 0-3.99 ng/ml, 4-7.99ng/ml and >8 ng/ml. The groups were compared retrospectively. In the case of the serum progesterone levels >1.5ng/ml, serum estradiol levels >3500 pg/ml at the time of hCG trigger, or retrieval oocytes ≥ 20 , all embryos cryopreserved.

Result: The mean age of the patients was 36.8 years old. Parity, fertilization methods and stimulation protocols were not significantly different among the groups. In the cycles with high serum progesterone levels, there were more retrieved oocytes and viable embryos ($p < 0.001$). However, mature oocyte rates, fertilization rates, good quality embryo rates, implantation rate, pregnancy rates and miscarriage rates were not significantly different.

Conclusion: This study suggests that serum progesterone levels on the day of oocyte retrieval day are related to the quality of viable embryos, but not to pregnant outcome in fresh embryo transfer cycles.