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Title

The Predictive Value of the First Serum hcg Level Following Transfer of a Single, Euploid, Frozen Embryo Transfer (FET)

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Objective:
Despite the increasing utilization of single, euploid frozen blastocyst transfer (FET) as a treatment strategy, prognostic thresholds for the initial serum HCG level have yet to be established. This study seeks to identify the HCG thresholds correlative of successful intrauterine pregnancy.

Design:
Retrospective cohort analysis

Materials and Methods:
Patients that underwent single, euploid FET resulting in a positive serum HCG (>2), from June 2011 to March 2016, were included. Serum HCG levels were measured 9 days post FET and analyzed with respect to maternal age, BMI, blastocyst expansion grade, implantation and clinical pregnancy rates. All embryos were biopsied at the blastocyst stage, with ploidy determined by PCR. Data was analyzed by student's t-test, Chi-square, Kruskal-Wallis, linear and binary logistic regression.

Results:
Of the 876 single euploid FETs, 91% (n=802) had a serum hCG >2, with 73.2% continuing to implantation (n=641) and 67.6% resulting in ongoing pregnancies(n=592). Serum HCG levels were drawn 9 days after FET in 649 patients with 77.8% implantation (n=505) and 71.8% clinical pregnancy rate (n=466). Neither odds of implantation nor clinical pregnancy were influenced by maternal age, BMI or blastocyst expansion grade. Serum HCG levels were lower in patients with BMI>30 (OR -4.39 [95% CI (-6.3)-(-2.46). p=0.0012]. Serum HCG levels significantly predicted the probability of implantation (OR 1.02 [95% CI 1.02-1.03], p<0.0001)

and clinical pregnancy (OR 1.03 [95% CI 1.02-1.04], p<0.0001. HCG thresholds for clinical pregnancy (Table 1) were not correlated with maternal age, degree of blastocyst expansion or BMI.

Conclusions:

Serum HCG levels measured 9 days after transfer are a predictive marker for implantation and clinical pregnancy. The reported HCG thresholds offer the most direct evidence to aid clinicians in counseling patients regarding their prognosis after a single, euploid FET, regardless of patient age, BMI or embryo quality.

Support:

None.

Table:

Probability of Clinical Pregnancy (%)	Serum HCG 9 days post-transfer
50	26.5
75	67.1
80	80.6
90	107.6
95	134.6
>99	185.3