Non-Invasive miRNA-Based Endometrial Receptivity Testing Supports Personalized Embryo Transfer Outcomes

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Study question

Can a novel non-invasive endometrial receptivity test based on miRNA expression profiling support personalized embryo transfer (pET) timing and improve IVF pregnancy outcomes?

Summary answer

This cohort reports a 73.1% clinical pregnancy success rate (30/41) following non-invasive endometrial receptivity testing, demonstrating promising clinical utility.

What is known already?

Endometrial receptivity testing has been clinically used to identify the optimal implantation window for personalized embryo transfer (pET) in IVF treatments. While proponents emphasize its benefits for patients with a history of implantation failure or advanced maternal age, the clinical utility and efficacy of such testing remain debated, partly due to the invasive and painful nature of tissue sampling. A less invasive yet accurate alternative is needed to justify its routine use and improve reproductive outcomes.

Study design, size, duration

This retrospective study included 110 patients who underwent endometrial receptivity testing at two sites between February and December 2024, with clinical outcomes analyzed for those proceeded with ora®-guided pET.

Participants/materials, setting, method

Blood samples were collected from patients undergoing hormone replacement therapy (HRT) cycles on day P+5 (120 hours after progesterone administration). The blood samples were then analyzed by ora®, a non-invasive endometrial receptivity test that utilizes microRNA (miRNA) expression profiling to determine the optimal time for embryo transfer. Clinical pregnancy outcomes were assessed following pET guided by ora® recommendations.

Main Results

Among the 110 patients who underwent ora® testing, 78 (70.9%) were identified as receptive, 26.3% in the pre-receptive stage, and 2.7% in the post-receptive stage. Based on the ora® recommended timing, 41 patients proceeded to undergo pET, with confirmed pregnancy results available at the time of this analysis. The overall pregnancy success rate following ora® - guided pET was 73.1%, with 30 patients achieving clinical pregnancy and 11 experiencing implantation failure. Out of the 30 pregnant patients, 11 had a history of implantation failure.

Noteworthily, the pre-receptive group achieved a pregnancy rate of 76.9%, which was 5% higher than the standard window of implantation (WOI) group (72%), demonstrating the clinical efficacy of ora® guided embryo transfer. The post-receptive group showed a lower pregnancy rate (66%), likely due to the small sample size (n=3). Among the 30 successful pregnancies, 12 patients were identified with a displaced WOI, suggesting a 40% displacement rate. Furthermore, pre-receptive results were more commonly observed in older patients, with an average age of 39.3 years in the pregnancy group and 39.5 years in the implantation failure group. These findings underscore the potential of using ora® to optimize embryo transfer timing, particularly in patients with a displaced WOI or advanced maternal age.

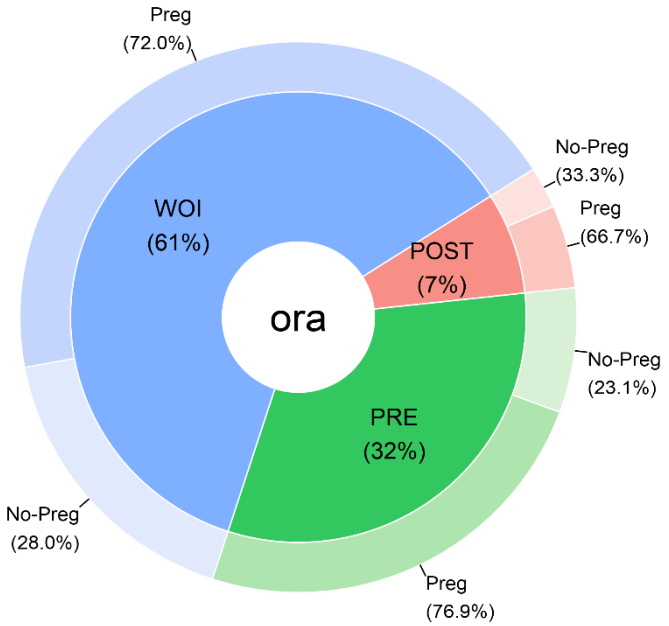

Fig1. pET pregnancy rate based on ora®'s recommendation

Limitations and Wider Implication

This study highlights the potential of a patient friendly and clinically effective miRNA-based endometrial receptivity test. The ease of collecting and storing blood samples during standard frozen embryo transfer cycles presents a viable alternative to avoid mock cycles, enabling a more effective and efficient IVF cycle management.

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