

INTRODUCTION

- Successful embryo implantation relies on maternofetal dialogue and a receptive endometrium.
- Abnormal receptivity leads to implantation failures in 2/3 of cases, necessitating personalized care for patients with infertility¹.
- Tests based on specific genes expression during the window of implantation (WOI) have been developed to predict endometrial receptivity, suggesting a personalized embryo transfer (pET) on the optimal receptivity day.
- The effectiveness of shifting the WOI on pregnancy rates remains unproven.
- We developed Adhesio, an innovative tool based on endometrial receptivity and embryo-endometrium crosstalk transcriptomic signatures to predict endometrial receptivity and successful implantation.

STUDY OBJECTIVES

- Evaluate Adhesio's ability to predict endometrial receptivity status and implantation success.
- Determine the accuracy of WOI shift strategy and effectiveness of pET.

STUDY DESIGN

- A total of 104 patients presenting for fertility treatments were randomized into two groups: study (n=50) and control (n=54).
- Two biopsies were taken at day PG+6 and PG+8 in substitute cycles and analyzed using Adhesio. The analysis predicted receptive, partially, or non-receptive endometrium, recommending the optimal transfer day.
- FETs of the study group were performed according to test recommendation. For the control group, the first FET was done according to the standard of care at PG+6. In the event of implantation failure, the second FET was performed according to Adhesio recommendation.

STATISTICAL ANALYSIS

- Qualitative variables were described using frequency and percentage distributions.
- The mean, standard deviation, median, and IQR values were used to describe the quantitative data.
- Statistical analyses were performed using R software (version 4.1.2).

RESULTS

Table 1. Baseline characteristics.

| Variable | Overall (n = 104) | Adhesio group, (n = 50) | Control group, (n = 54) |
|-----------------------------|-------------------|-------------------------|-------------------------|
| Age at randomization | | | |
| Mean (SD) | 34.0 (4.1) | 34.7 (4.3) | 33.3 (3.8) |
| Median (IQR) | 33.0 (31.0, 36.0) | 34.0 (31.2, 37.0) | 33.0 (31.0, 35.0) |
| Weight | | | |
| Mean (SD) | 73 (19) | 76 (21) | 71 (17) |
| Median (IQR) | 68 (60, 80) | 68 (61, 85) | 68 (59, 77) |
| Height | | | |
| Mean (SD) | 166 (7) | 167 (6) | 165 (7) |
| Median (IQR) | 166 (162, 170) | 167 (163, 170) | 166 (160, 170) |
| BMI | | | |
| Mean (SD) | 26.5 (6.4) | 27.1 (7.1) | 25.9 (5.7) |
| Median (IQR) | 23.8 (22.0, 29.7) | 23.7 (22.2, 32.5) | 23.9 (22.0, 29.0) |

Table 2. Distribution of patients in the Adhesio group according to the transfer day recommended by the test.

| FET day recommended | Adhesio group, n = 50 |
|---------------------|-----------------------|
| PG +5 | 2 (4.0%) |
| PG +6 | 18 (36%) |
| PG +7 | 1 (2.0%) |
| PG +8 | 15 (30%) |
| PG +9 | 10 (20%) |
| PG +10 | 4 (8.0%) |

RESULTS (cont.)

Table 3. Transfer outcomes by FET day recommended (PG+6 vs other day) for all patients regardless of the group (84 FETs).

| Variable | PG+6 | |
|-------------------------|-------------|--------------|
| | No (n = 55) | Yes (n = 29) |
| Transfer Outcome | | |
| Not Pregnant, n (%) | 44 (80) | 12 (41) |
| Pregnant, n (%) | 11 (19.6) | 17 (58.4) |

CONCLUSION

- Adhesio demonstrated good predictive capabilities for successful pregnancy when the endometrium is receptive at PG+6.
- However, pETs on days other than PG+6 did not improve pregnancy rates, even with optimal receptivity.
- Delaying the day of transfer decreased the success of embryo implantation calling into question the effectiveness of the pET strategy used by the endometrial receptivity tests based on transcriptomic signatures.
- The strategy of improving receptivity on the standard transfer day (PG+6) should be considered to provide patients with the best care management.

REFERENCE

Messaoudi S. and al. (2019). 15 years of transcriptomic analysis on endometrial receptivity: what have we learnt?. Fertility Research and Practice, 5(1), 1-9.