Home testing for timing of natural frozen embryo transfer (nFET) procedures; a solution for reducing clinic visits during Covid-19

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Background

- Natural Frozen Embryo Transfer (nFET) is an increasingly popular procedure as it avoids early embryonic exposure to an artificially created hormonal environment which may be detrimental to pregnancy outcomes.[1,2]
- nFET requires tracking of hormonal and endometrial changes in order to identify the day of ovulation and to appropriately schedule the day of transfer.
- Tracking of cycles is typically done through repeated blood tests and transvaginal ultrasound scans requiring an average of 4.35 clinic visits per cycle.[3]
- These methods are invasive and expensive and multiple clinic visits can be inconvenient and time consuming for the patient.[4]
- During the Covid-19 pandemic, infertile couples have found provision of treatment delayed due to closure of fertility clinics and concern for the potential risks associated with Covid-19 in pregnancy.
- **Objective:** We sought to determine whether timing of nFET using home ovulation tests (OT) is a viable alternative to multiple clinic visits.

Methods

- This was a prospective study of 46 women aged 24–45 years undergoing standard nFET at IVF Australia, Bondi Junction.
- Regular clinic visits were completed in parallel with home cycle monitoring of urinary estrogen and luteinising hormone (LH) using the Clearblue™ Advanced Digital Ovulation Test.
- The OT used displays 'High' fertility when it detects a rise in the level of estrogen, and 'Peak' fertility when it detects the LH surge.
- To calculate the predictive ability of the OT, the first reported 'High' or 'Peak' day was used prior to the clinically defined day of ovulation.
- A qualitative questionnaire was used to capture women's treatment experience, opinions and the perceived advantages and disadvantages of each method.
- The study was conducted between March 2017 and August 2019.

Results

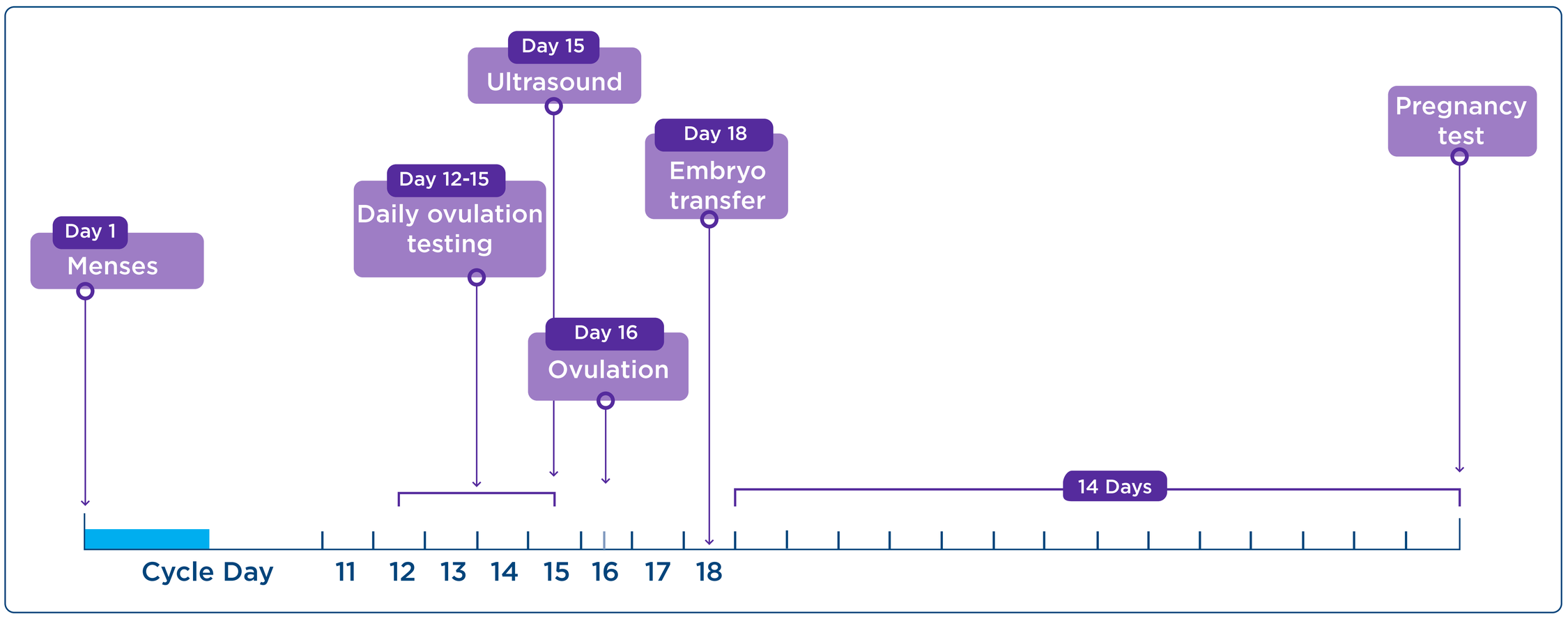
- The pregnancy rate was 46% for the 37 women who underwent FET confirmed by positive serum hCG.
- Clinic ovulation day was defined for 36 women through repeated blood tests and ultrasound scans, and of these, 35 used OTs.
- The OT indicated 'Peak' fertility in 29 women; 6 women stopped testing before likely day of 'Peak' fertility as transfer day was already scheduled.
- The mean time to ovulation from 'Peak' fertility was 0.8 days (Table 1).
- 'High' fertility was detected by 29 volunteers and occurred on average 4.1 days prior to ovulation (Table 1).

Table 1: Predictive ability of the OT shown by mean time in days between ovulation test result and ovulation day determined by the clinic

OT End Point	n	Mean time to ovulation (days)	Median	Min	Max
First High Day	29	4.1	4.0	1	8
First Peak Day	18	0.8	0.0	0	7
First High or Peak Day	35	3.6	3.0	0	8

- All volunteers gained warning of ovulation using the OTs, with the average prediction time of 3.6 days.
- Women reported the main advantage of home ovulation testing was the convenience (82%). The main reported disadvantage was having to remember to test each day (60%).
- 45% of women in this study preferred home testing compared to regular clinic appointments.
- The mean number of clinic visits per patient was 2.7 and the maximum was 7 for one patient. These visits could be saved if home testing was adopted as a tool to supplement the existing cycle monitoring process for nFET (Figure 1).

Figure 1: Example of cycle monitoring using ovulation testing for optimal nFET planning.
Note: A single ultrasound scan required as final confirmation for timing the transfer day procedure.



Conclusion

Home cycle monitoring using dual-hormone ovulation tests is a viable alternative for nFET that can minimise exposure to Covid-19 through a reduction in clinic visits. It was found to be an effective and more convenient method for timing nFET procedures, which the study site clinic has adopted to reduce risk during the Covid-19 pandemic.

Trial Registration Number: NCT03156374

Declaration of interest

Sarah Weddell and Sarah Johnson are employees of SPD Development Company Ltd, a wholly owned subsidiary of SPD Swiss Precision Diagnostics GmbH, the manufacturer of Clearblue pregnancy and fertility tests. The study was funded by SPD Development Company Ltd.

References

1. Gomaa H, Baydoun R, Sachak S, Lapana I and Soliman S. (2016) Elective single embryo transfer: Is frozen better than fresh? JBRA Assist Reprod 20(1): 3–7.
2. Pinborg A, Loft A, Aaris Henningsen AKA, Rasmussen S and Andersen AN. (2010) Infant outcome of 957 singletons born after frozen embryo replacement: the Danish National Cohort Study 1995-2006. Fertility and Sterility 94(4): 1320–1327.
3. Weissman A, Levin D, Ravhon A, Eran H, Golan A and Levran D. (2009) What is the preferred method for timing natural cycle frozen–thawed embryo transfer? Reproductive BioMedicine Online 19(1): 66–71.
4. Su HW, Yi YC, Wei TY, Chang TC and Cheng CM. (2017) Detection of ovulation, a review of currently available methods. Bioeng Transl Med 2(3): 238–246.