KEEPING EMBRYOS WARM WHEN IT MATTERS MOST: LARGE TEMPERATURE VARIATION OF EMBRYO TRANSFER CATHETERS DURING ROUTINE TRANSFER

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Background

During embryo transfer (ET), thermal excursions below physiologic temperature of 37°C may impair embryo viability. Clinics use various warming procedures (heated work surfaces, pre-warmed media, incubator pre-staging), yet the temperature retention of different ET catheter systems under real-world handling is not well characterized. Recent catheter-tip temperature telemetry shows ET is a persistent weak link in thermal control, with rapid drops toward ambient temperatures during loading/transit and that protocols tweaks can mitigate these losses.1,2

Objective

The purpose of this study was to evaluate the various ET catheter warming procedures and which method resulted in temperatures closest to physiological temperature.

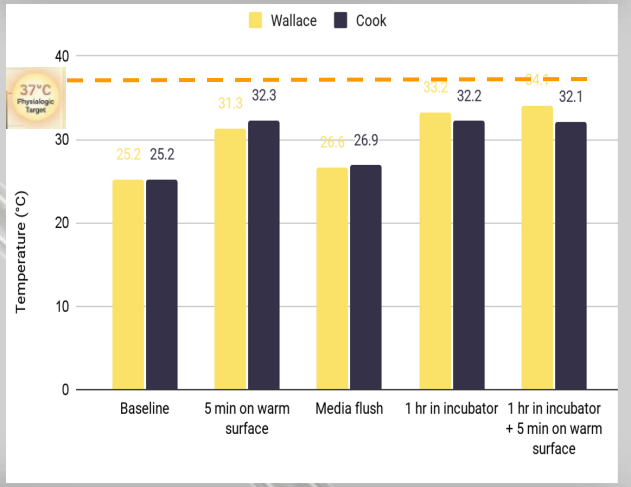
References

1. Macklon N, Delikari O, Lamanna G, et al. Embryos are exposed to a significant drop in temperature during the embryo transfer procedure: a pilot study. Reprod Biomed Online. 2021;43(2):305-313. doi:10.1016/j.rbmo.2021.05.014.
2. Gurner KH, Wong RC, Hale C, et al. Temperature fluctuations during embryo transfer can be mitigated by optimizing transfer protocol. Reprod Biomed Online. 2024;48:103034. doi:10.1016/j.rbmo.2024.103034.

Materials and Methods

This was a study done using two types of embryo transfer catheters routinely used across a network of IVF laboratories. The catheters being examined were the Wallace® Surepro® Embryo Replacement Catheter with Obturator, Soft 23cm Supported Elective Two-Stage (CooperSurgical) and the Soft-Pass™ Embryo Transfer Catheter Set with EchoTip® (Cook Medical). Temperatures within the tip end of the catheters were measured with a Greisinger GMH3710 high-precision thermometer at four stages: (1) room temperature (baseline), (2) after 5 minutes on a 37.2°C warmed surface inside the laminar flow hood, (3) immediately after flushing with 37.2°C pre-warmed culture media, (4) after 1 hour in a 37.2°C warming incubator, and (5) after 1 hour in a 37.2°C warming incubator and 5 minutes on a 37.2°C warmed surface inside the laminar flow hood. Our primary endpoint measured was catheter lumen (tip) temperature.

Results



Conclusions

Under routine warming conditions, neither embryo transfer catheter achieved or maintained temperatures near the physiologic target (37°C). These findings highlight temperature loss at critical workflow junctures—especially at the most critical last step of the embryo journey in the laboratory—and support revisiting IVF ET SOPs to maximize prewarming and to minimize time between warming and use. Further replicated testing across multiple sites and environmental conditions, and possible correlation with clinical outcomes when performed with different prewarming techniques, are warranted.