Building better endometria for IVF:
usER testing and clinical trends in endometrial quality over time.

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Background: The quality of endometrial preparation is an often-overlooked contributor to the overall success or failure of IVF cycles. usER testing (Matris[TM], Synergyne Imaging Technology, Inc, Saskatoon, SK) is a non-invasive per-cycle approach to assess the quality of endometrial preparations. The usER system scores endometrial quality on a 10 point scale (0 – poorest receptivity; and 10 – highest receptivity) and has been shown to improve pregnancy rates and conserve embryos through selection of endometria with usER scores of 7.0 or higher for embryo transfer.

Objectives: First, we aimed to determine if routine usER testing could be used to identify improvements in clinical endometrial preparations over time through refinement and standardization of protocols within a multi-physician fertility care centre. Second, we aimed to determine if achieving consistently higher quality endometrial preparations was associated with changes in pregnancy rates.

Methods: We conducted a retrospective analysis including 2905 IVF cycles conducted at a single multi-physician ART clinic. All patients who underwent usER testing as part of their reproductive care and had a b-hCG result available from 2014 to 2021 were included. We assessed the annualized distribution of usER scores for each calendar year under consideration. Descriptive statistics were prepared based on the annualized data. Changes in distribution of usER scores and pregnancy rates over time were analyzed.

Results: The distribution of usER scores followed a bimodal pattern between 2014 and 2021 with modes both above and below usER scores of 7.0. The mode below 7 reduced incrementally over time, while the mode above 7 increased over time. Year over year, usER score distribution tightened around the mode above 7, incrementally became more left-skewed about the mean, and the standard deviation trended lower (ANOVA: $p < 0.0001$). Pregnancy rates followed an upward trend between 2014 and 2020. Results are summarized (Figure 1).
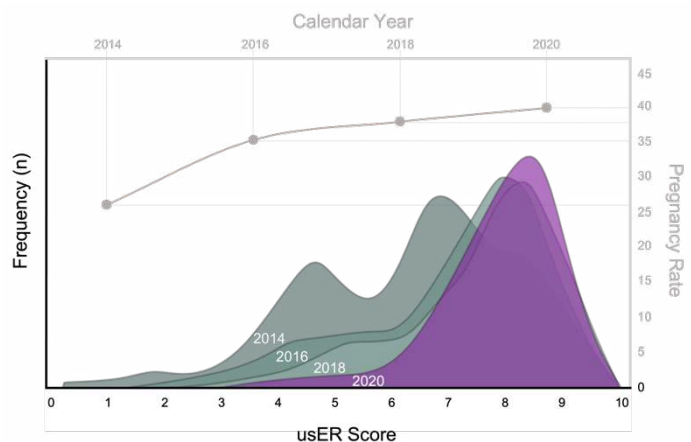
Conclusions: Refinement of endometrial preparation protocols resulted in significant changes to the distribution of usER scores over time. usER testing is sensitive enough to identify changes in endometrial quality over time and can be used to enhance endometrial preparation protocols.