Synergy at work: two heads are better than one

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In this issue of *Journal of Assisted Reproduction and Genetics*, there are two studies that leverage large database mining to detect national trends in IVF. Kawwass et al. utilizes data from the National ART Surveillance System (NASS), which is supported by the Centers for Disease Control (CDC) and to which 97% of IVF clinics in the USA report their national patient and cycle outcomes annually [1, 2]. Bocca et al. utilizes data from the Society for Assisted Reproductive Technology Clinic Outcomes Reporting System (SART CORS), which is supported by SART and to which 85% of IVF clinics in the USA report their national patient and cycle outcomes annually [3, 4].

NASS and SART CORS databases are similar but not identical. Both are large web-based databases that allow investigators to conduct hypothesis-driven research using robust outcome measures, such as live birth, to look at trends in clinical practice, associations of patient and cycle characteristics with IVF outcomes, and the value of specific interventions such as intracytoplasmic sperm injection (ICSI) or assisted zona hatching. Limitations of this type of data mining include the retrospective nature of the analysis, self-reported data that may be inaccurate, and the need for rigorous bio statistical analysis to properly control for confounding variables that yields clinically relevant findings.

Research projects using SART CORS cycle-level data are reviewed by the SART research committee of clinical scientists and physicians to ensure the requested data is appropriate for the project and confirm proper study design including proposed bio statistical analysis of the dataset. Researchers utilizing SART CORS data must be affiliated with a SART member center. Proposals utilizing NASS cycle-level data must be submitted to CDC's Research Data Center (RDC) Review Committee comprised of an RDC analyst, representatives of the NASS, and a confidentiality officer. Similar to projects using SART CORS data, proposals to use NASS data are reviewed for appropriateness and assurance that the requested data is sufficient to fulfill study objectives. Additionally, projects utilizing NASS data are examined for the potential public health benefit and consistency with the CDC's mission.

Both Kawwass et al. and Bocca et al. used national IVF data from 2004 to 2015. Both looked at non-donor gamete cycles involving ICSI for male factor, followed by transfer of fresh embryos to the uterus. Particular focus in both studies was on surgically obtained sperm for ICSI (both testicular and epididymal) and possible associations with outcome measures of live birth, spontaneous abortion, or miscarriage. Both report an increased utilization of surgically extracted sperm over the study period of 2004–2015. Bocca et al. analyzed 24,763 ICSI cycles using surgically extracted sperm reported to SART CORS and saw a significant decrease in overall live birth rate with advanced maternal age which has well established. However, they did not see any associations between surgically extracted sperm instead of ejaculated sperm prior to ICSI, and live birth, premature live birth, or miscarriage. Kawwass et al. concluded from an analysis of 347,078 fresh cycles reported to NASS that pregnancy and perinatal outcomes were statistically significant but clinically similar with confidence intervals approaching one, between cycles involving epididymal versus ejaculated sperm, and between testicular versus ejaculated sperm.

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These two studies utilized different databases with different processes of data collection. The study design was different from each other as was the data analysis. However, both studies demonstrate that national trends detected in these studies using NASS data and SART CORS data are in general agreement. The authors of both publications noted the absence of additional data weakened their conclusions. As of 2016, the CDC expanded the number of data fields; IVF centers are required to report including male infertility diagnosis and paternal age, two data points that would have been useful for these studies [2]. While the additional fields do add to the reporting burden, information such as male infertility diagnosis will benefit future studies. The similar conclusion of the two studies is a very positive and reassuring outcome and should encourage clinical investigators to use both NASS and SART CORS to pose hypotheses and test them using these large databases.

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