EXPANDING EXTENDED SEARCH TO REDUCE EXCISION? AN ANALYSIS OF EXTENDED SPERM SEARCH AND MICROFREEZE (EZZM) OUTOMCES IN ART

Objective: ESSM has become an option for patients with severe male factor (MF) such as azoospermia and cryptospermia as a way to avoid more invasive procedures such as microtesticular sperm extraction.[1] The finding of sperm and optimizing outcomes for ART can be challenging for lab management, with an option for both fresh and frozen ESSM samples. Our aim was to evaluate our ESSM outcomes with focus on fresh versus frozen specimen outcomes.

Materials/Methods: This was a retrospective cohort study at a single academic medical center. The primary outcome was fertilization rate [FERT] (#2pronuclear zygotes/#oocytes for intracytoplasmic sperm injection-ICSI) in patients utilizing ESSM between 1/1/2022-8/30/2023. All patients who underwent extended search, where sperm was recovered, were included. Kruskal Wallace test was used for analysis with significance set at $p<0.05$.

Results: 39 patients underwent 51 ESSM cycles. 21 of these patients were excluded as there were no sperm recovered. 18 patients had sperm recovered with a total of 34 In vitro Fertilization (IVF) cycles with 17 subsequent Frozen Embryo Transfer (FET) cycles. For pts with sperm recovered, the reasons for MF requiring ESSM included: history of chemotherapy (n=2); severe oligoasthenoteratozoopermia or azoospermia (n=13); and 1 patient each with a history of spina bifida affecting the urogenital system, severe narcotic abuse and a genetic MF from a Robertsonian translocation with primary ciliary dyskinesia. Of the IVF cycles, 21 utilized frozen ESSM sample, 9 utilized fresh ESSM, and 4 utilized both frozen and fresh ESSM samples (mixed). Median number of sperm recovered was 16 (IQR 12.3-48); median oocyte age was 36y (IQR 31-39.3); median sperm age was 42.5y (IQR 33-41.5); median FERT was 63.0% (IQR 29.6%-71.4%); median euploid rate (#euploids/#blasts) was 33.3% (IQR 18.8%-71.4%); median blast formation rate (BFR) (#total embryos/#2PN) was 66.0% (IQR 33.0-60.0%). Of the embryos transferred, 1 patient underwent 2 fresh transfers with untested embryos which resulted in 1 spontaneous abortion (SAB) and 1 ongoing pregnancy (OP). The overall OP + Live Birth Rate (LBR) rate was 53% (9/17); negative pregnancy rate was 29.5% (5/17); biochemical pregnancy rate was 6% (1/17), SAB rate was 6% (2/17).

A subgroup analysis of fresh vs frozen ESSM was then performed, see Table 1. Table 2 lists OP and LBR of fresh vs frozen ESSM. Of the two live births in mixed cohort, one was ultimately with frozen and one with fresh.

Conclusion: ESSM is an emerging option for patients with severe MF infertility with an overall LBR+OP rate of 53% which is comparable to the national euploid livebirth rate of 56.3% for patients 35-37yo.[2] While our study found no differences between fresh ESSM and frozen ESSM, larger studies are needed to fully evaluate the difference. ESSM is a viable option for patients with severe MF to avoid invasive testicular extraction and possible complications. The difference between fresh vs frozen ESSM warrants continued investigation.

References:

1) Eliveld J et al. The risk of TESE-induced hypogonadism: a systematic review and meta-analysis. Hum Reprod Update. 2018 Jul 1;24(4):442-454. doi: 10.1093/humupd/dmy015. PMID: 29726895
2) SART National Database: 2022

Table 1: Subgroup Analysis of Fresh Vs. Frozen ESSM

	Fresh (n=9)	Frozen (n=20)	Both (n=5)	p- value
Egg source Age (years)	34 (30-36.5)	36.5 (31.25-40)	37 (32-39.5)	0.46
Sperm source Age	39 (33-43)	36 (33-39)	40 (33-48)	0.25
Fertilization Rate	0.71 (0.63-0.81)	0.4 (0.1-.49)	0.4 (0.28-0.63)	0.19
Blast formation rate	0.5 (0.37-0.6)	0.4 (0.25-0.71)	0.53 (0.45-0.7)	0.25
Euploid Rate	0.5 (0.37-0.64)	0.5 (0-1.00)	0.6 (0.26-0.83)	0.125

Table 2: LBR divided by Fresh Vs. Frozen ESSM

	OP + LBR
Fresh (n=4)	3/4 (75%)
Frozen (n=8)	4/8 (50%)
Both (n=5)	2/5 (40%)