COUNSELING AT THE EXTREMES OF OVARIAN RESERVE; IN VITRO FERTILIZATION ATTRITION RATES

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Background: A key component of in vitro fertilization (IVF) counseling is the attrition rate, defined as the expected loss in numbers from retrieved oocytes to blastocyst embryos in an IVF stimulation cycle. Effective pre-treatment counseling is crucial to set realistic expectations and pre-define relative success (Devroe 2022).

Objective: We aimed to develop a customized pre-treatment counseling tool for patients undergoing IVF by evaluating attrition rates by both ovarian reserve and stimulation protocol type.

Materials and Methods:
We completed a retrospective chart review of patients aged 18 to 44 years who underwent IVF treatment at our academic institution between January 1, 2013, and March 23, 2023. Patients with a diagnosis of polycystic ovarian syndrome (PCOS), unexplained infertility, and diminished ovarian reserve were included. Those who underwent oocyte cryopreservation or had cleavage stage embryo transfers were excluded from the study. Patients were then placed into four groups based on clinical diagnosis and ovarian stimulation protocol: polycystic ovary syndrome (PCOS) antagonist protocol, unexplained infertility antagonist protocol, diminished ovarian reserve (DOR) minimal stimulation protocol (MiST), and DOR antagonist protocol. Cycle outcomes, including number of retrieved oocytes, mature oocytes, fertilized embryos, and blastocysts were reviewed. Maturation, fertilization, and blastocyst conversion rates were calculated and compared. Female age, Antimüllerian Hormone (AMH), fertilization rate, and blastulation rate were compared between groups using ANOVA and post-hoc pairwise analyses.

Result(s):
This study included a total of 385 cycles undergone by 313 patients.

The number of mature oocytes differed among all groups, with the fewest in the DOR MiST protocol group, followed by patients with DOR antagonist protocol, unexplained infertility, and PCOS groups ($P < 0.001$). Unsurprisingly, this trend persisted throughout the fertilization process, with the fewest 2PN embryos and blastocysts in the DOR group and the greatest numbers in the PCOS group. (Table 1).

Fertilization rates did not vary among study groups, but there were notable differences in blastulation rate. PCOS patients had a higher blastulation rate compared to those with unexplained infertility ($p<0.001$). Among DOR patients, those who used the MiST protocol had a notably higher blastulation rate compared to the antagonist protocol (65% vs. 46%, $p<0.001$) (Table 2).

Conclusion(s): Patients with DOR who undergo minimal stimulation have less attrition than patients with DOR who undergo antagonist protocol. Patients with PCOS have less attrition than

patients with unexplained infertility. A counseling diagram with attrition rates broken down by diagnosis/protocol can help providers provide patient-specific expectations.

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References: Devroe, J., Peeraer, K., D'Hooghe, T. M., Boivin, J., Laenen, A., Vriens, J., & Dancet, E. A. F. (2022). Great expectations of IVF patients: The role of gender, dispositional optimism and shared IVF prognoses. *Human Reproduction*, *37*(5), 997–1006. https://doi.org/10.1093/humrep/deac038

Table 1. Demographics

	PCOS n=143	**Unexplained n=120**	**DOR antagonist stimulation protocol n=45**	**DOR minimal stimulation protocol n=77**	**p**
Age	31.0 +/- 4.3	33.2 +/- 4.0	35.6 +/- 4.6	36.5 +/- 3.73	<0.001
BMI	29.4 +/- 6.7	26.3 +/- 5.3	27.8 +/- 5.8	29 +/- 7.2	<0.001
AMH	8.6 +/-6.4	3.5 +/- 2.7	0.7 +/- 0.2	0.57 +/- 0.27	<0.001

Table 2. Cycle outcomes

	PCOS	**Unexplained Infertility**	**Diminished Ovarian Reserve, Antagonist Protocol**	**Diminished Ovarian Reserve, Minimal Stimulation Protocol**	**p**
Oocytes Retrieved	24.4	17.7	8.0	3.0	P <0.001
Mature oocytes	18.8	13.2	5.7	2.5	P <0.001
2PN Embryos	12.5	9.5	3.9	2.0	P <0.001
Blastocysts	7.4	4.9	2.0	1.5	P <0.001
Oocyte Maturity Rate	78%	77%	72%	85%	P <0.001
Fertilization Rate	68%	73%	71%	76%	P=0.16
Blastulation Rate	60%	51%	46%	65%	P <0.001