THE COMBINATION OF OVARIAN REJUVENATION WITH PLATELET-RICH PLASMA (PRP) AND TRANSVAGINAL OVARIAN DRILLING (TVOD) INCREASES THE PERCENT OF EUPLOID EMBRYOS PER CYCLE IN LOW PROGNOSIS IVF PATIENTS

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Background: We have shown that TVOD improves the live birth and euploid embryo rate among patients with PCOS. Intra-ovarian PRP has been shown in several studies to improve blastocyst formation and euploidy rates in non-PCOS poor prognosis patients. We present a pilot study of the combination of TVOD and PRP for its effect on IVF outcomes in poor prognosis, non-PCOS patients.

Objective: This study describes the combined effect of TVOD and PRP on euploid embryo yield and percentages in poor prognosis IVF patients.

Materials and Methods: A single-institution, retrospective cohort time-series pilot trial completed between July 2022 and May 2024. All patients had combined TVOD and PRP ovarian rejuvenation. All PGT-A IVF cycles analyzed were within 6 months before or after the procedure. TVOD+PRP was performed with transvaginal ultrasound guidance under propofol anesthesia, a 17-gauge retrieval needle under suction punctured each ovary drilling the stroma proximally to distally 50 to 100 times. After TVOD, 2-4mL of autologous PRP was injected into each ovarian stroma. The first IVF cycle following TVOD+PRP was compared to the IVF cycle immediately prior to the procedure with paired t-tests. All cycles within six months of the procedure were compared with unpaired statistics. The primary outcome was the change in both the number and percentage of euploid blastocysts. Secondary outcomes included: the number of blastocysts, the number and percentage of euploid and mosaic embryos, and aneuploid embryos.

Results: 14 subjects met inclusion criteria. Mean age and initial AMH were 39$\pm$2.5 and 1.2$\pm$0.9 respectively. TVOD+PRP led to an increase in the number of mature oocytes (Table 1). There was also an increase in the percentage yield of euploid blastocysts. The percentage of blastocysts that were either euploid or mosaic increased significantly. There was a clinically important trend toward increase in the number of euploid embryos per retrieval and increase in the number of euploid or mosaic embryos available for transfer. There was a decrease in the number and percentage of aneuploid embryos per retrieval (Table 1). For patients at least 40 years old, percent of aneuploid embryos decreased remarkably from 93%$\pm$12 to 37%$\pm$39 (p=0.008). When compared to our prior data set on PRP alone, the addition of TVOD further lowered the percent of embryos with aneuploidy from -9.4% to -48.3% (p=0.0075).

Conclusion: In this retrospective time series pilot trial, the combination of TVOD followed by intra-ovarian PRP (ovarian rejuvenation) markedly improved the percentage and may increase

the yield of euploid blastocysts. TVOD+PRP lowered the number of aneuploid embryos significantly more than with PRP alone.

Table 1. Effect of TVOD + PRP on IVF outcomes, Paired Testing

	Pre-TVOD + PRP mean(SD)	**Post-TVOD + PRP** mean(SD)	**p-value**
Mature Oocytes	4.9(3.3)	6.5(4.6)	0.05*
Euploid Blastocysts	0.3(0.5)	0.9(1.2)	0.08/NS
Euploid and Mosaic Embryos	0.4(0.5)	1.1(1.3)	0.08/NS
Aneuploid	1.7(1.3)	0.9(1.3)	0.02*
Percentage of Euploid per Blastocyst	9.5% (17)	28% (36)	0.03*
Percentage of Euploid and Mosaic Embryos per Blastocyst	11% (17)	31% (38)	0.02*
Percentage of Aneuploids	78% (35)	30% (35)	0.004*