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

METHODS

- Retrospective cohort time-series pilot trial of all patients who underwent **combined TVOD and PRP for ovarian rejuvenation** between **2022 and 2024** at one IVF center was performed.
- All PGT-A IVF cycles analyzed were **within 6 months** before or after the procedure.
- The **first IVF cycle following TVOD+PRP was compared to the IVF cycle immediately before the procedure** using paired t-tests**. All cycles within six months of the procedure were compared** using unpaired statistics.
- The **primary** outcome was the change in 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.**
- Statistical analysis employed paired and non-paired t-tests, and Wilcoxon testing in R programming software.

- **TVOD+PRP** was performed using transvaginal ultrasound guidance.
- First, **TVOD was performed** using a 17-gauge, 35-cm retrieval needle with constant suction at 170 mmHg for drilling. Each ovary was punctured once and penetrated to its full thickness between **50 to 100 times, moving from the lateral to medial surface of each ovary** with visualization of the iliac vein and artery throughout the procedure.
- **PRP administration** was then performed by attaching the syringe to a 17-gauge 35mm needle inserted through a transvaginal ultrasound needle guide. The ovaries were visualized using ultrasound guidance and aligned with the needle guide to prevent harm to nearby structures.
- The needle was then advanced with **puncture of the central ovarian stroma and 2-4mL of PRP sample was injected** into each ovary.

RESULTS

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*

- **14 subjects** met the inclusion criteria.
- **Mean age** and **initial AMH** were **39±2.5** and **1.2±0.9,** respectively. TVOD+PRP led to an **increase** in the **number of mature oocytes**
- There was 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 an **increase in the number of euploid embryos per retrieval** and an **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.
- For patients **at least 40 years old, percent of aneuploid embryos decreased** remarkably from **93%±12 to 37%±39 (p=0.008)**.
- 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.

BIBLIOGRAPHY

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