



Intra-ovarian platelet rich plasma improves IVF outcomes in women with diminished ovarian reserve

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Introduction

- There is rising incidence of females with diminished ovarian reserve (DOR) especially among Asian ethnicity. With the emergence of regenerative medicine, multiple studies have evaluated the role of intra-ovarian platelet rich plasma (PRP), demonstrating a beneficial role in improving ovarian reserve parameters (serum Follicular stimulating hormone (FSH), serum anti-Mullerian hormone (AMH), AFC).
- Despite its' favorable effects on biochemical markers and AFC, data regarding improvement in clinical outcome remains elusive and led to inception of this study.

Objective of the study

Does intra-ovarian instillation of platelet rich plasma (PRP) improves the clinical outcome of IVF cycles in women with Diminished Ovarian reserve (DOR)?

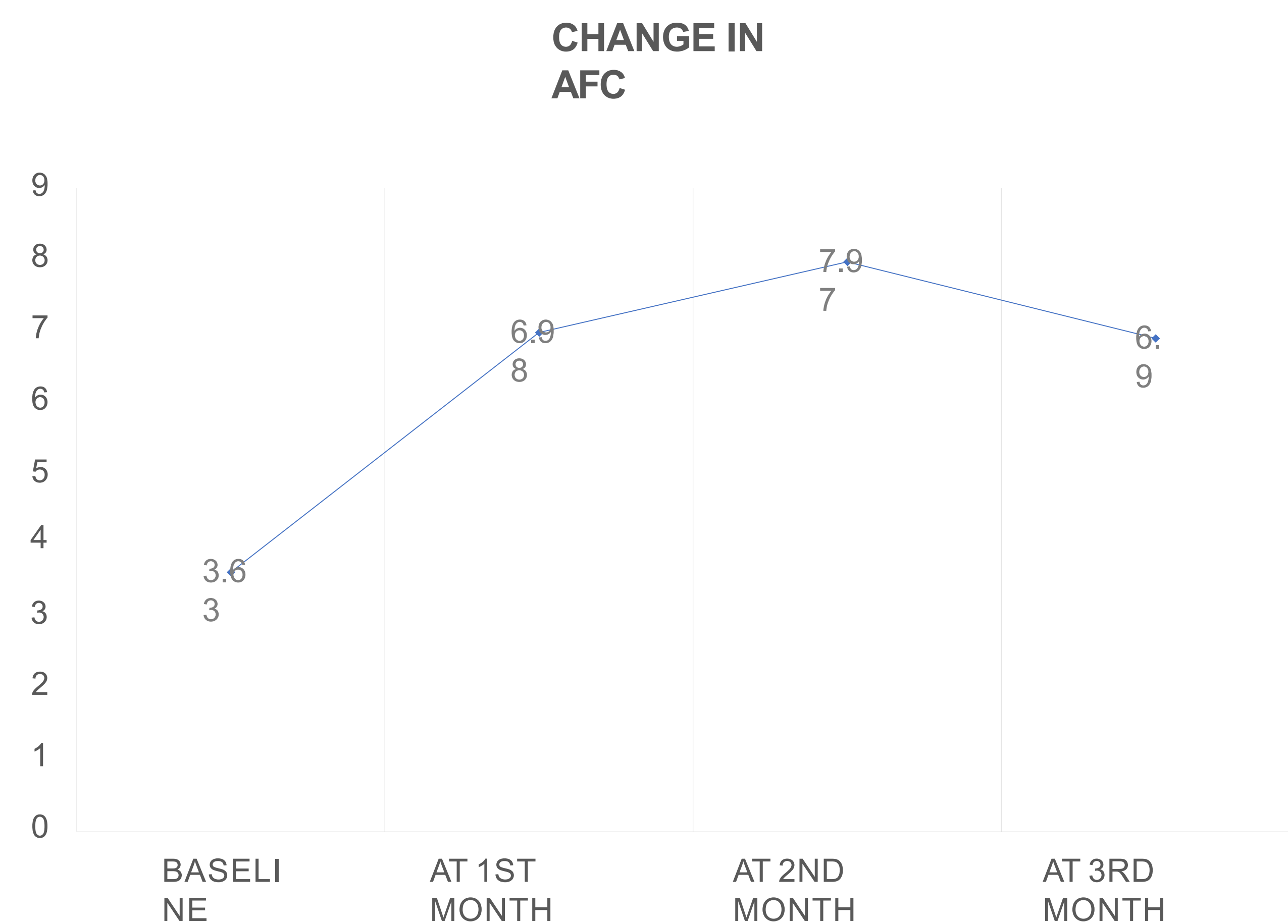
Study Design

- A prospective interventional study was conducted at Division of Reproductive Medicine of a tertiary care institute. 41 infertile females (20-39 years) with poor ovarian reserve (AMH <1.2 ng /ml; AFC<5) (POSEIDON criterion) were enrolled in the study during a 6-month period beginning from August 2021.

Materials & Methods

- 3 ml fresh PRP was prepared from 30 ml venous blood and instilled equally between the two ovaries trans-vaginally under ultrasound guidance between day 7-10 of menstrual cycle under sedation.
- Patients were followed up for three-consecutive months to assess ovarian reserve parameters including serum FSH, AMH and AFC.
- Patients showing significant improvement in parameters were recruited for fresh IVF cycles using standard Antagonist protocol with 1% transdermal testosterone. Outcomes were analysed using linear mix effect model.

Results



- The average platelet concentration in PRP was ~10,00,000 platelets/ μ L.
- Mean age of enrolled patients was 31.22 $\pm$ 4.16 yrs.
- Linear improvement in AFC (3.63 vs 6.98 vs 7.97 vs 6.90, p <0.001) was observed from baseline to three consecutive follow-up months with maximal response witnessed in 2nd month in 57.1% of those undergoing IVF cycle.
- No significant difference in Serum FSH (p =0.11) and AMH (p =0.16) from the baseline.
- 35 patients (85.3%) responded to the treatment and subsequently underwent IVF cycle. 5 out of 35 cycles were cancelled due to inadequate response to stimulation in spite of highest dose of gonadotropins(450IU).
- Average number of oocytes retrieved was 5.7 $\pm$ 2.2 whereas mean number of MII oocytes was 4.63 $\pm$ 1.85.
- The fertilization rate and the cleavage rate were 92.4% and 74.1% respectively.
- Mean number of grade 1- day 3 embryos were 1.25 $\pm$ 0.55 with surplus embryos available for cryopreservation in 14 patients
- The overall clinical pregnancy rate per transfer was 33.33%. No adverse events were reported.

Literature Review

- The benchmark study by Sfakianoudis et al. where they used PRP as a novel approach to treat infertility in poor responder patients. All were treated with autologous PRP injection and within 3-months interval FSH decreased by 67.33%, while AMH increased by 75.18% followed by natural conception in three patients.

- Similarly Pantos et al. reported a case series of two women with premature ovarian failure and one menopausal woman. Post PRP instillation, all underwent natural cycle IVF with improved hormonal profile and achieved pregnancy within 2–6 months following PRP treatment.
- Due to lack of conclusive evidence regarding the use of PRP and the limited treatment options available for such cohort of patients, it becomes imperative to study the efficacy of this novel approach.

Conclusion

- Intra-ovarian PRP instillation leads to consistent improvement in functional ovarian reserve thus achieving clinical pregnancy rate of 33.3% per cycle in women with DOR.
- This therapy is effective in improving the reproductive outcomes in couples who were left with the option of oocyte donation or adoption. Therefore, a large randomized trial with a “no-intervention” arm is further required to validate these results.

Acknowledgement

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