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P-795 Comparison of intra-ovarian platelet rich plasma versus autologous bone marrow derived stem cell instillation in women with diminished ovarian reserve for ovarian rejuvenation

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Study question: To compare role of intra-ovarian platelet rich plasma (PRP) versus marrow derived stem cell (SC) instillation for improvement in ovarian reserve (AFC, AMH and FSH)

Summary answer: Both PRP and SC therapy improves the ovarian reserve however, response to PRP is superior to SC post intervention

What is known already: With increasing incidence of females with diminished ovarian reserve (DOR), posing a serious challenge in terms of limited treatment options for these couples. Clinicians are trying to find effective strategies besides oocyte donation or adoption. Of late, novel ovarian rejuvenation approaches has been investigated which are currently available for research purposes only. Multiple studies are evaluating effect of intra-ovarian PRP or autologous SC instillation, the results are encouraging as they are showing improvement in ovarian reserve thus bringing a paradigm shift in treatment options. None of the published studies so far have compared PRP versus SC in DOR population.

Study design, size, duration: A prospective comparative study was conducted at Division of Reproductive Medicine of a tertiary care institute. 72 infertile females (20-39 years) with poor ovarian reserve (AMH <1.2 ng/ml; AFC<5) were enrolled in the study between January 2020 to December 2021. The two comparative groups underwent either intra-ovarian PRP instillation (n=42) or autologous SC transplantation (n=30).

Participants/materials, setting, methods: After the two groups were matched (PRP vs SC) for baseline characteristics (Age, AMH, AFC, FSH, Estradiol), 30 subjects in each group were compared for change in serum FSH/AMH/Estradiol levels, AFC, right and left ovarian volume at 1st month and 3rd month post intervention from the baseline. This was also compared between the two groups using Student t-test. The cost and procedural pain measured using Visual analog scale (VAS) were also compared between the groups.

Main results and the role of chance: After matching for baseline characteristics, significant ~ 1.8/2 and ~1.5/1.6 fold increase in AFC at 1st/3rd month post intervention ($p<0.001$) was observed after PRP instillation and SC transplantation respectively. This significant improvement was observed more in PRP group than SC group at 3rd month post intervention (7.07 vs 5.60, $p=0.02$), while no significant difference existed at 1st month of follow up. However, there was no significant improvement in serum FSH, AMH and Estradiol levels ($p>0.05$) from the baseline at 1st and 3rd month post intervention in both the groups. Similarly, there was no significant difference between the two groups in serum FSH level (7.98 IU/ml vs 9.62 IU/ml, $p=0.062$; 8.26 IU/ml vs 9.50 IU/ml, $p=0.15$), AMH level (1.62 ng/ml vs 1.02 ng/ml, $p=0.27$; 1.35 ng/ml vs 0.95 ng/ml, $p=0.24$), Estradiol level (49.12 pg/ml vs 56.48 pg/ml $p=0.443$; 54.7 pg/ml vs 61.12 pg/ml, $p=0.44$), right ovarian volume (3.13 cm³ vs 2.49 cm³, $p=0.06$; 3.37 cm³ vs 2.74 cm³, $p=0.063$) and left ovarian volume (2.98 cm³ vs 2.47 cm³, $p=0.102$; 2.87 cm³ vs 2.34 cm³, $p=0.103$) at 1st and 3rd month post intervention respectively. PRP was more cost-effective and associated with less pain (32.5 mm vs 28.13 mm, $p=0.02$), and better patient compliance.

Limitations, reasons for caution: This was a comparative study and the participants were not randomized but were matched for the baseline characteristics. Also due to impact of Covid-19 causing intermittent pause in non-essential facilities like IVF services, a smaller sample size could be enrolled and also clinical outcomes could not be evaluated

Wider implications of the findings: This study, although comparative, for the first time highlights the beneficial role of PRP over SC, thus can establish superiority of PRP as minimally invasive, economical, patient friendly and a recommended therapy for ovarian rejuvenation and folliculogenesis, providing the DOR females an opportunity to produce their own offspring.

Trial registration number: CTRI/2020/01/022726