The role of Ovarian PRP Therapy in Poseidon Poor Responders Women undergoing ICSI Cycle

Abstract

Background: Poor ovarian responders (POR) women represent a challenge issue in assisted reproduction techniques (ART). As an effort to optimize conception rates in these patients, ovarian platelet-rich-plasma (PRP) injection prior to intracytoplasmic sperm injection (ICSI) cycles has been advised to improve both the quantity and quality of oocytes and embryos, owing to its regenerative properties for ovarian milieu ultimately improved ART outcomes.

Objective : This study aims to evaluate the impact of ovarian PRP therapy compared to control in Poseidon POR females undergoing ICSI cycles.

Material and Methods: A randomized controlled trial was conducted from Jan 2024 to Feb 2025, involving 102 Poseidon POR women, Participants were divided into a PRP group (n=50), who received ovarian PRP injections and a control group (n=52), who received no PRP. All participants underwent ICSI cycles, embryological and pregnancy outcomes were compared between both groups within each Poseidon group.

Results: metaphase II (MII) oocytes count showed increment in the PRP group compared to controls (p value=0.036). However, the mean number of MII oocytes remained comparable in both groups respectively (3.8±2.6 vs 4.2±1.8). Alongside, no significant differences in embryological outcomes or pregnancy rates were noticed in PRP and control patients among all Poseidon groups (all p value>0.05).

Conclusion: Although ovarian PRP might increase MII oocytes count in Poseidon POR women underwent ICSI cycles. When compared to control, it does not provide significant benefits for oocyte and embryo parameters, nor does it improve pregnancy rates in these women.

Key words: ovarian PRP, IVF cycle, Poseidon poor responders.

2. Materials And Methods

2.1. Study design This study was conducted at a private fertility center in Karbala, Iraq, from Jan 2024 to Feb 2025. All participants provided written informed consent prior to enrollment, and ethical approval was obtained from the College of Medicine, Karbala University (reference number 25-8).

2.2. Participants

A total of 102 Poseidon POR women were enrolled where Inclusion criteria were infertile Poseidon groups 2, 3, 4 women with no history of chronic illness or pelvic pathology. All male partners were either normozoospermic or had mild OAT delivered fresh ejaculated samples for ICSI.

Exclusion criteria were ovarian failure due to sex chromosome abnormalities, current use of anticoagulants and history of bleeding disorders. Participants were assigned into two groups: Study group (n=50), who underwent ovarian PRP injections once or twice times within six months prior to ICSI cycle, and control group (n=52), who did not receive PRP therapy.

2.3. PRP preparation and injection

Twenty mL of peripheral blood was drawing under sterile conditions using Lora PRP tubes (Modern Technology Company). Frist the blood was centrifuged at 1600 rpm for 10 minutes (soft spin). Then the plasma and superficial buffy coat were transferred into a sterile tube containing no anticoagulant and centrifuged again at 3500 rpm for 5 minutes (hard spin). The upper 2/3rd (platelet-poor plasma, PPP) were discarded, and the platelet pellets were homogenized in the lower 1/3rd of plasma to create 3 mL of platelets concentrate of 3-5 times higher than basal and injected within one hour of preparation (11). During early-mid follicular phase, using TV-US guidance and conscious sedation, 1.5 ml of PRP was injected into each ovary’s subcortical layer using a 17-gauge ovum pick-up needle. A second PRP injection was administered when subsequent ORTs (AMH,AFC) and hormone levels (FSH, LH, E2) showed suboptimal results in patient’s next menstrual cycles.

2.4. ICSI cycle outcomes

All patients starting same COS protocol began on CD3 using (300-450 iu) of Gonal-F (r-FSH); Merck ± (u-HMG);LG in flexible antagonist protocol, (Cetrotide); Merck. Final oocyte maturation was triggered by 250 mcg r-hCG (Ovitrelle; Serono) ± 0.2 mg GnRH agonist (Decapeptyl; Merck) 35 hours before oocyte retrieval when dominant follicles reached (17–18) mm. Embryological outcomes including; MII oocytes, embryos quantity and quality were compared in both group. In all embryo transfer cycles, 2–4 embryos grade A± B of age 2–5 day were transferred. The clinical outcomes included pregnancy rate (serum β-HCG ≥100 mIU/mL), miscarriage rate (the loss of a pregnancy before 24 weeks), Live Birth rates (delivery of a living baby after 24 weeks) and overall cycle outcomes were compared in both groups.

2.5. Statistical Analysis

The collected data were coded, entered, and analyzed using IBM SPSS version 29 (IBM Corp., Chicago, IL, USA). The data were presented as frequencies, percentages, means, standard deviations, and ranges. Comparisons between means of quantitative data were conducted using the independent Student's t-test. Differences in proportions (qualitative data) were assessed using Pearson's Chi-square test, with Yates' correction or Fisher's Exact test applied where appropriate. Statistical significance was defined as a p-value ≤ 0.05.