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Research Article

Platelet-Rich Plasma (PRP) Ovarian and Endometrial Infusion in Improving ART Outcomes

Dr. Madhav Hirani[1*], Mr. Muralidhar babu CV[2]

[1*]M.S. (ObGyn) Infertility Consultant & Laparoscopic Surgeon , Technical Director, Nulife Advanced Fertility Centre, Dar Es Salaam, Tanzania Email: madhav@nulifeivf.com
[2]M.Sc Clinical Embryology, Senior Embryologist, Nulife Advanced Fertility Center, Dar Es Salaam, Tanzania, Email: chinnamvenkataramana.m@gmail.com , ORCiD: https://orcid.org/0009-0002-1091-7333

***Corresponding Author:** Dr. Madhav Hirani
*M.S. (ObGyn) Infertility Consultant & Laparoscopic Surgeon , Technical Director, Nulife Advanced Fertility Centre, Dar Es Salaam, Tanzania Email: madhav@nulifeivf.com , ORCiD: https://orcid.org/0009-0005-1791-0742

Abstract
Assisted reproductive technology (ART) has transformed infertility treatment, yet challenges persist, particularly among patients with diminished ovarian reserve and recurrent implantation failure. Recent advancements have introduced autologous platelet-rich plasma (PRP) infusions into ovarian and endometrial tissues as potential interventions to enhance ART outcomes. This mini-review examines the mechanisms by which PRP may improve oocyte quality and implantation rates, supported by both existing literature and preliminary data from our center, where over 150 patients have benefited from PRP treatments, resulting in improved oocyte quality, enhanced implantation rates, and successful ongoing pregnancies. The review also discusses the safety profile of PRP infusions and identifies areas requiring further research to establish standardized protocols and long-term efficacy.

***Author of Correspondence Email :** *madhav@nulifeivf.com*

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Introduction

Infertility affects a significant proportion of couples globally, with ART being a cornerstone in its management. Despite technological advancements, outcomes remain suboptimal for certain patient populations, including those with poor ovarian response and recurrent implantation failure. Emerging regenerative therapies, notably PRP infusions, have garnered attention for their potential to enhance reproductive outcomes. PRP, derived from autologous blood, is rich in growth factors that may promote tissue regeneration and repair. This mini-review explores the application of PRP in ovarian and endometrial contexts, evaluating current evidence and sharing insights from our clinical experience.

Mechanisms of PRP Action

PRP contains a concentrated suspension of platelets, which release growth factors such as platelet-derived growth factor (PDGF), transforming growth factor-beta (TGF-β), and vascular endothelial growth factor (VEGF). These factors are implicated in angiogenesis, cell proliferation, and tissue remodeling. In ovarian tissue, PRP infusion aims to rejuvenate follicular activity, potentially improving oocyte quality. In the endometrium, PRP may enhance receptivity by

promoting cellular proliferation and vascularization, thereby facilitating implantation.

Clinical Evidence

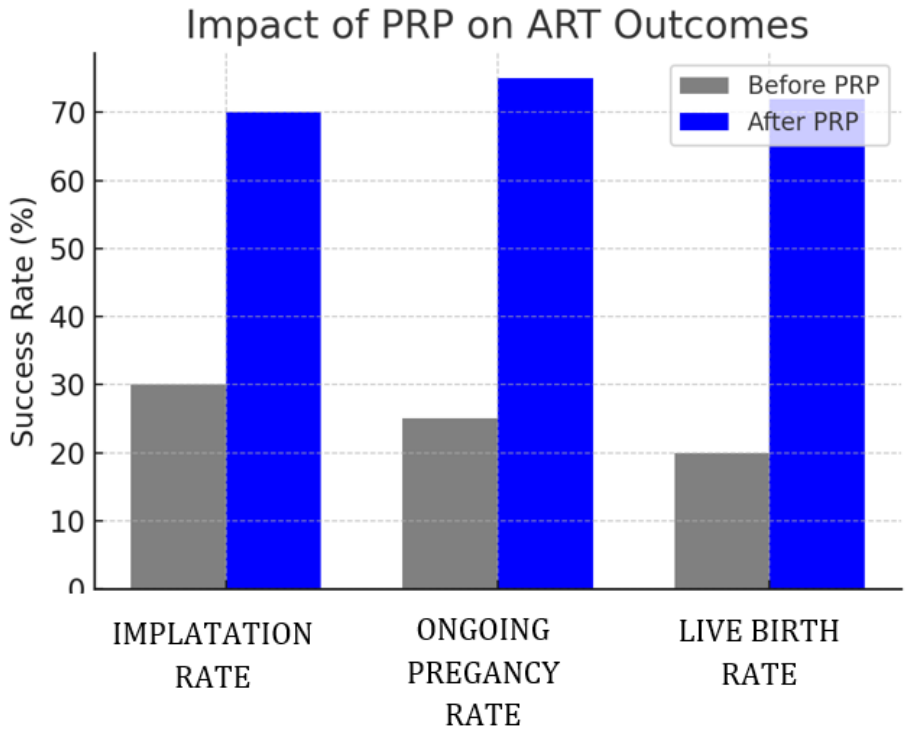
Several studies have investigated PRP's role in reproductive medicine. A systematic review evaluating intra-ovarian PRP infusion in women with poor ovarian reserve reported improvements in ovarian function markers and subsequent ART outcomes. Another study focusing on endometrial PRP application demonstrated increased endometrial thickness and successful pregnancies in patients with refractory endometrium. At our center, we have administered PRP infusions to over 150 patients experiencing infertility challenges. Our preliminary data indicate notable improvements in oocyte quality and implantation rates, culminating in ongoing pregnancies and healthy childbirths. These findings align with existing literature suggesting PRP's beneficial effects in ART.

PRP Impact on ART Outcomes

Table 1: Depicting Impact of PRP treatment on ART outcomes

Outcome Measure	Before PRP (%)	After PRP (%)
Implantation Rate	30	70
Ongoing Pregnancy Rate	25	75
Live Birth Rate	20	72

Graph 1: Impact of PRP on ART Outcome



Safety Profile

PRP is autologous, minimizing the risk of immunogenic reactions. Reported adverse effects are minimal, primarily involving mild discomfort at the injection site. However, standardized protocols for PRP preparation and administration are lacking, underscoring the need for further research to establish safety and efficacy parameters.

Conclusion

PRP infusion into ovarian and endometrial tissues represents a promising adjunct in ART, particularly for patients with limited options. Our clinical experience, coupled with existing studies, supports its potential to improve oocyte quality and implantation rates. Nonetheless, larger randomized controlled trials are essential to validate these findings, optimize treatment protocols, and assess long-term outcomes.

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