

INTRODUCTION

Study question: Does the intrauterine administration of peripheral blood mononuclear cells (PBMCs) and platelet-rich plasma (PRP) effect the outcome of embryo transfer in women with poor endometrium?

Summary answer: After the intrauterine application of PRP and PBMCs in patients with refractory endometrium, the endometrial thickness was satisfactory ($P < 0.05$). PRP and PBMCs were effective in improving pregnancy outcomes in IVF patients with repeated implantation failure (RIF) ($P < 0.05$).

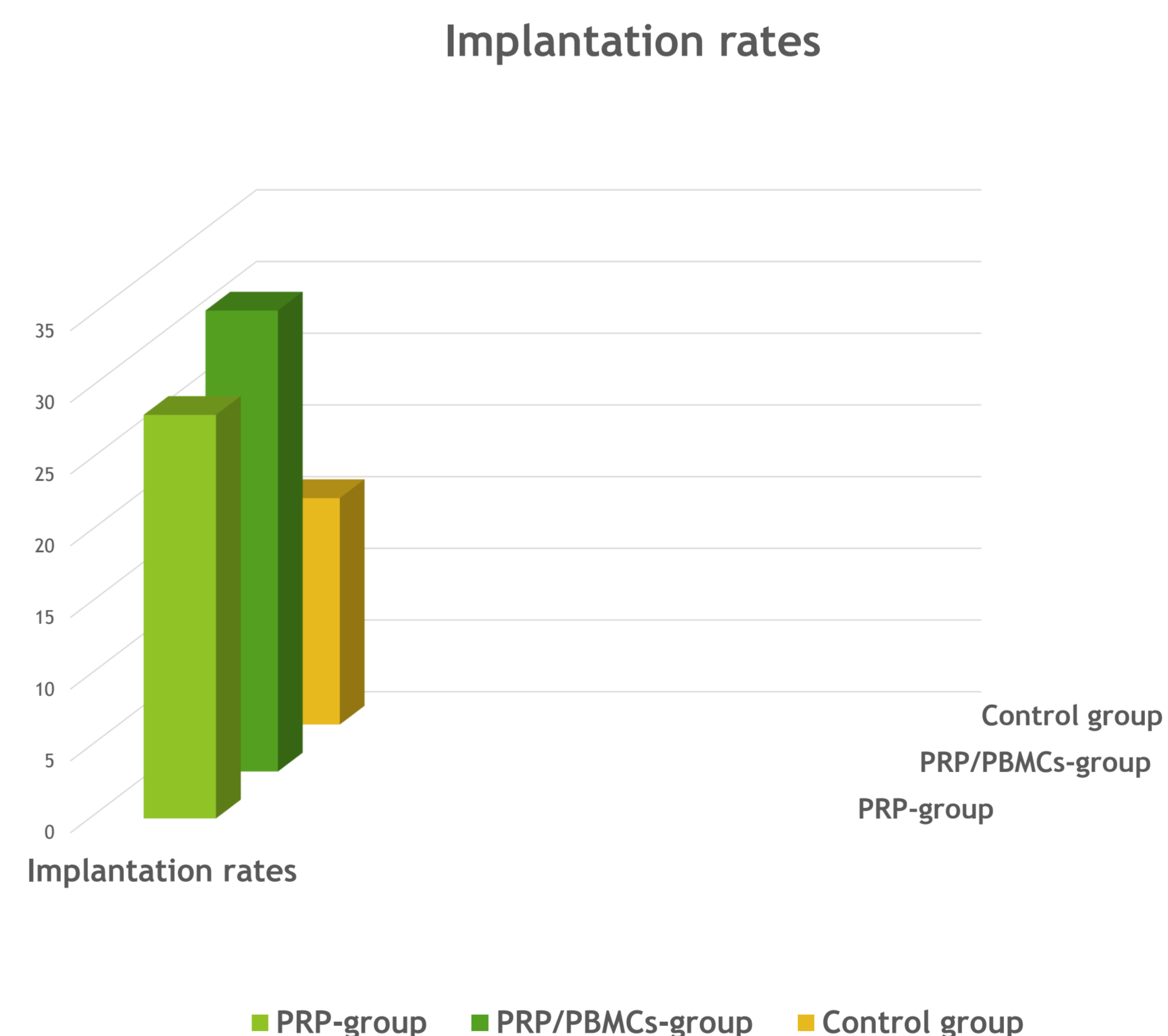
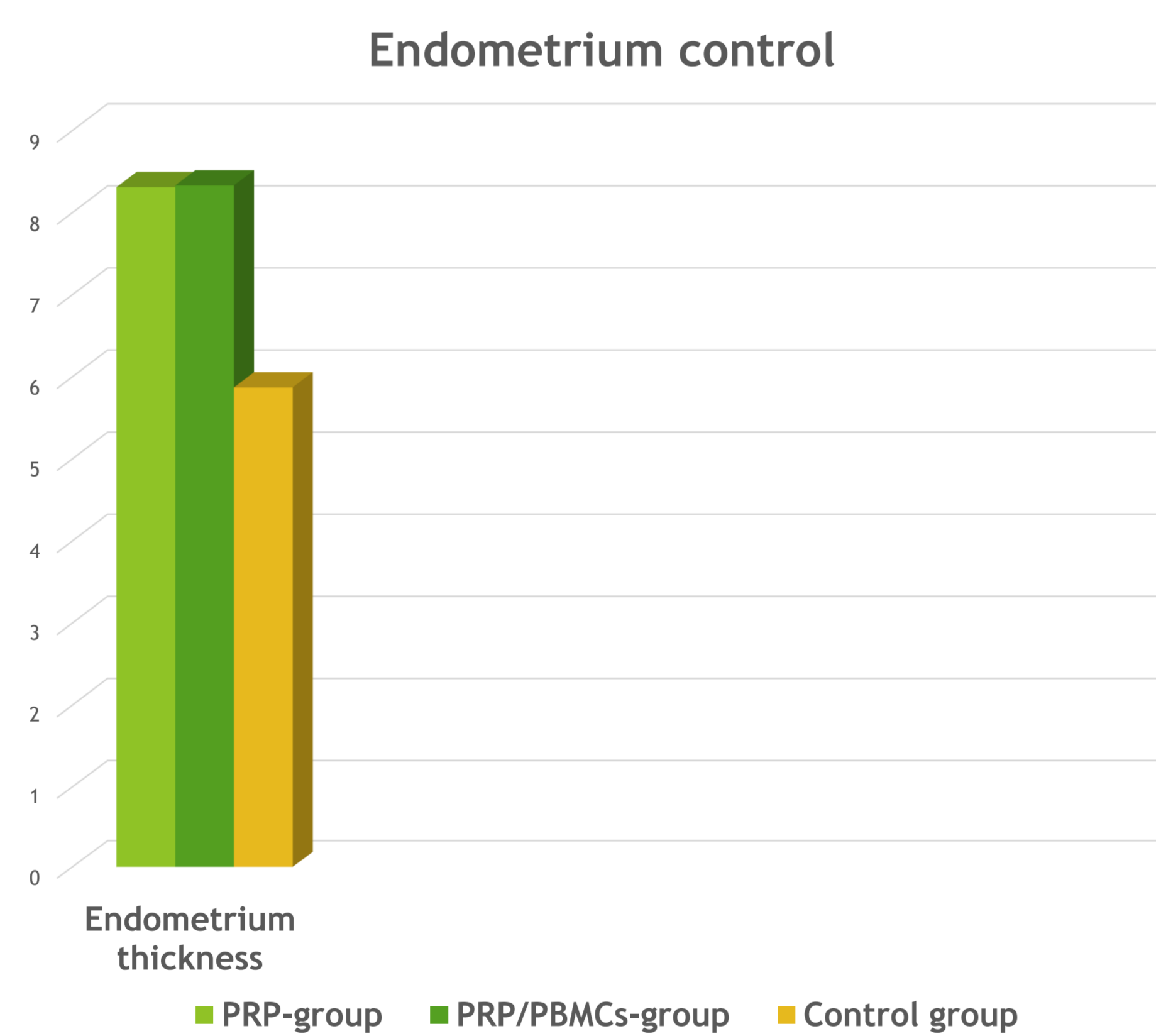
What is known already: The endometrium plays an important role in achieving optimal outcomes of assisted reproductive technologies. PRP is a novel method that is used in reproductive medicine to improve the IVF outcome. The mechanisms of PRP have not been completely elucidated. Recently, the intrauterine infusion of PRP has been described as a way to promote endometrial growth and receptivity. Besides that, it has been proposed that intrauterine administration of peripheral blood mononuclear cells modulates maternal immune response to favor implantation.

RESULTS

Study design: The effect of the intrauterine application of PRP and PBMCs to improve the endometrium thickness in RIF patients was studied. The implantation rates were evaluated in RIF patients after PRP/PBMCs procedure. The study's protocol was approved by the Center's IRB.

Participants/materials/settings/methods: Two experimental subgroups of RIF patients were analyzed retrospectively. Subgroup 1 (PRP group): included 32 cycles of 20 patients with the mean age 34.2 ± 3.6 y.o. Subgroup 2 (PRP/PBMCs group): included 28 cycles of 17 patients with the mean age 34.9 ± 5.8 y.o. The control group included 38 cycles of 23 patients with the mean age 35.7 ± 4.2 y.o. In Subgroup 1 PRP was infused on the 9th day of hormone replacement therapy cycle and progesterone administration day. Both PRP infusion (on the 9th day of hormone replacement therapy cycle) and PBMCs infusion (before the ET procedure) were used in Subgroup 2. All patients were transferred two good-quality blastocyst-stage embryos. T-test and Chi-squared test were used for data analysis. $P < 0.05$ was considered statistically significant.

Main results and the role of chance: The average endometrium thickness on day of progesterone administration was: 8.31 ± 1.18 mm in Subgroup 1; 8.33 ± 0.89 mm in Subgroup 2. It was significantly thicker than control group (5.87 ± 0.81 mm) (Student t-test $t=2.13$, $P = 0.04$ and $t=2.04$, $P = 0.048$ respectively). There was no difference in endometrium thickness between examined subgroups. The implantation rate was significantly higher in subgroups compared with the control group (28.13% and 32.14% vs. 15.79%, $P < 0.05$, respectively). There is a tendency to an increase of implantation rate when using the combination of PRP/PBMCs in RIF patients.



CONCLUSION

After the intrauterine application of PRP and PBMCs in patients with refractory endometrium, the endometrial thickness was satisfactory ($P < 0.05$). PRP and PBMCs were effective in improving pregnancy outcomes in IVF patients with repeated implantation failure (RIF) ($P < 0.05$).

Reasons for caution: The embryo transfer was done in case of the endometrium thickness not less than 6 mm.

Wider implications of the findings: There is the urge for well-designed randomized studies to improve our knowledge in both autologous nonimmunogenic and immunogenic therapy in reproductive medicine.

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