

NEW APPLICATIONS OF PLATELET-RICH PLASMA IN GYNECOLOGY

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Poštovano uredništvo,

Obraćam Vam se sa ciljem da skrenem pažnju na nove primene plazme obogaćene trombocitima (engl. *platelet-rich plasma* – PRP) u ginekologiji – intrauterinu primenu i intraovarijalne injekcije.

Upotreba PRP-a privukla je značajnu pažnju u poslednjoj deceniji zahvaljujući sposobnosti da promoviše regeneraciju tkiva putem diferencijacije ćelija i stimulacije trofičkih aktivnosti. Plazma bogata trombocitima se široko koristi za promociju zarastanja i regeneracije u različitim oblastima medicine, kao što su ortopedija, stomatologija, dermatologija, plastična hirurgija, nega pacijenata sa komplikacijama dijabetesa, te tokom kardiohirurških operacija i carskog reza [1]. U oblasti ginekologije, PRP se koristi u tretmanu simptoma stres urinarnе inkontinencije i genitalne rejuvenacije [2]. Posebno su zanimljive novije metode primene PRP-a u ginekologiji, kao što su intrauterina primena i intraovarijalne injekcije PRP-a [3].

Intrauterina primena PRP-a sreće se kod stanja kao što su Ašermanov sindrom, gde dolazi do oštećenja bazalnog sloja endometrija i formiranja intrauterinih adhezija, zatim kod hroničnog endometritisa, kao i kod pacijentkinja u procesu vantelesne oplodnje sa nereceptivnim endometrijumom. Aghajanova i saradnici u radu *Autologous Platelet-Rich Plasma Treatment for Moderate-Severe Asherman Syndrome: The First Experience* prvi su pokazali primenu intrauterinih PRP infuzija kod ljudi. Studija je uključivala grupu od 15 pacijentkinja koje su primile autologni PRP sa Ašermanovim sin-

Dear Editorial Board,

I am reaching out to draw attention to new applications of platelet-rich plasma (PRP) in gynecology, particularly its intrauterine application and intraovarian injections.

The use of PRP has gained significant attention over the past decade due to its ability to promote tissue regeneration by facilitating cell differentiation and stimulating trophic activity. Platelet-rich plasma is widely used to enhance healing and regeneration in various medical fields, such as orthopedics, dentistry, dermatology, plastic surgery, the care of patients with diabetes-related complications, cardiac surgery and cesarean sections [1]. In gynecology, PRP has been applied in the treatment of stress urinary incontinence and genital rejuvenation [2]. Particularly intriguing are the emerging PRP applications in gynecology, such as intrauterine administration and intraovarian injections [3].

Intrauterine PRP application has been used for conditions such as Asherman's syndrome, which involves damage to the basal endometrial layer and the formation of intrauterine adhesions, as well as for chronic endometritis and patients undergoing in vitro fertilization (IVF) with a non-receptive endometrium. Aghajanova et al., in their study **Autologous Platelet-Rich Plasma Treatment for Moderate-Severe Asherman's Syndrome: The First Experience**, were the first to report intrauterine PRP infusion in humans. The study included 15 patients with Asherman's syndrome

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dromom putem Wallace IUI katetera neposredno nakon adheziolize, i 15 pacijentkinja u kontrolnoj grupi. Nije zabeležena statistički značajna razlika među grupama kada je u pitanju uspeh u začeću, usled nedovoljno velikog uzorka, ali je uspešno ukazano na sigurnost i pristupačnost intrauterine primene PRP-a [3]. Liu i saradnici sprovedli su meta-analizu koja sugerise da intrauterina aplikacija autologne plazme bogate trombocitima (PRP) može biti efikasan terapijski pristup za tanak endometrijum, jer povećava debljinu endometrija kod pacijentkinja sa tankim endometrijumom, i poboljšava ishod trudnoće, uz odsustvo neželjenih efekata [4].

Intraovarijalne PRP injekcije primenjuju se kod preuranjene ovarijalne insuficijencije (POI) i u menopauzi, sa ciljem sprečavanja ovarijalne atrezije i podsticanja rasta primordijalnih i preantralnih folikula. Cakiroglu i saradnici regrutovali su 311 žena sa POI za primenu intraovarijalnih autoloških PRP injekcija. Nakon šest nedelja, spontana trudnoća razvila se kod 23 pacijentkinje (7,4%), dok je kod preostale 201 žene, 70% razvilo barem jedan antralni folikul nakon tretmana PRP-om [5]. Eliasova meta-analiza je pokazala da je na osnovu analize najšireg naučnog pregleda do sada, koji se uglavnom sastoji od opservacionih studija, PRP tretman jajnika doveo do statistički značajnog poboljšanja glavnih parametara plodnosti kod žena sa smanjenom ovarijalnom rezervom kao što su broj antralnih folikula, AMH (Antimilerov hormon), FSH (folikulostimulirajući hormon), i LH (luteinizirajući hormon) [6].

Upotreba PRP-a na ovarijumima i endometriju pokazala je obećavajuće rezultate kod pacijentkinja sa niskom ovarijalnom rezervom ili nereceptivnim endometrijuom, kao i kod postojećih indikacija u ginekologiji u sferi zarastanja rana, lichen sklerozusa, vulvodinije, i stres inkontinencije urina. Kod primene PRP-a, ipak, postoje brojni izazovi u standardizaciji metode, usled individualnih razlika u broju trombocita i sadržaju faktora rasta kod pacijenata, zatim varijabilnost indikacija, te veliki broj različitih protokola za pripremu PRP-a. Važno je napomenuti da postoje pacijenti koji nisu kandidati za ovu metodu – pacijenti sa malignim bolestima, akutnim infekcijama, zatim sa poremećajima koagulacije i autoimunim bolestima. Smatram da ove metode zaslužuju mnogo više pažnje u našoj zemlji, ali i da je potrebno dalje potvrđivanje efikasnosti kroz dodatna velika, multicentrična rigorozno izvedena istraživanja, uz praćenje tokom dužeg vremenskog perioda.

*Srdačan pozdrav,
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who received autologous PRP via a Wallace IUI catheter immediately upon adhesiolysis, along with a control group of 15 patients. While no statistically significant difference in conception success was observed due to the small sample size, the study effectively demonstrated the safety and feasibility of intrauterine PRP administration [3]. Liu et al. conducted a meta-analysis suggesting that intrauterine application of autologous PRP may be an effective therapeutic approach for thin endometrium, as it increases endometrial thickness in affected patients, improves pregnancy outcomes, and is free of adverse effects [4].

Intraovarian PRP injections are used for premature ovarian insufficiency (POI) and menopause, aiming to prevent ovarian atresia and stimulate the growth of primordial and preantral follicles. Cakiroglu et al. recruited 311 women with POI for intraovarian autologous PRP injections. After six weeks, spontaneous pregnancy occurred in 23 patients (7.4%), while among the remaining 201 women, 70% developed at least one antral follicle following PRP treatment [5]. Elias's meta-analysis, which represents the most extensive scientific review to date (primarily based on observational studies), demonstrated that ovarian PRP treatment led to a statistically significant improvement in key fertility parameters among women with diminished ovarian reserve, including antral follicle count, anti-Müllerian hormone (AMH), follicle-stimulating hormone (FSH), and luteinizing hormone (LH) levels [6].

Although PRP application to the ovaries and endometrium has shown promising results in patients with low ovarian reserve or a non-receptive endometrium, as well as in established gynecological indications such as wound healing, lichen sclerosus, vulvodynia, and stress urinary incontinence, several challenges remain in standardizing the method. These include individual variations in platelet counts and growth factor content, variability in indications, and a large number of different PRP preparation protocols. It is also important to note that certain patients are not suitable candidates for this method, including those with malignant diseases, acute infections, coagulation disorders, and autoimmune diseases. I believe these methods warrant greater attention in our country and require further validation through large, multicenter studies conducted with rigor and long-term follow-up to confirm their efficacy.

*Best regards,
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LITERATURA / REFERENCES

1. Etulain J. Platelets in wound healing and regenerative medicine. *Platelets*. 2018 Sep;29(6):556-68. doi: 10.1080/09537104.2018.1430357.
2. Streit-Ciećkiewicz D, Kołodyńska A, Futyma-Gąbka K, Grzybowska ME, Gołacki J, Futyma K. Platelet rich plasma in gynecology-discovering undiscovered – review. *Int J Environ Res Public Health*. 2022 Apr 26;19(9):5284. doi: 10.3390/ijerph19095284.
3. Aghajanova L, Sundaram V, Kao CN, Letourneau JM, Manvelyan E, Cedars MI, et al. Autologous platelet-rich plasma treatment for moderate-severe Asherman syndrome: the first experience. *J Assist Reprod Genet*. 2021 Nov;38(11):2955-63. doi: 10.1007/s10815-021-02328-5.
4. Liu X, Qian C, Jiang X, Zhou Y, Feng X, Ding Y, et al. Efficacy of platelet-rich plasma in the treatment of thin endometrium: a meta-analysis of randomized controlled trials. *BMC Pregnancy Childbirth*. 2024 Aug 30;24(1):567. doi: 10.1186/s12884-024-06741-3.
5. Cakiroglu Y, Saltik A, Yuceturk A, Karaosmanoglu O, Kopuk SY, Scott RT, et al. Effects of intraovarian injection of autologous platelet rich plasma on ovarian reserve and IVF outcome parameters in women with primary ovarian insufficiency. *Aging (Albany NY)*. 2020 Jun 5;12(11):10211-22. doi: 10.18632/aging.103403.
6. Éliás M, Kónya M, Kekk Z, Turan C, das Virgens IPA, Tóth R, et al. Platelet-rich plasma (PRP) treatment of the ovaries significantly improves fertility parameters and reproductive outcomes in diminished ovarian reserve patients: a systematic review and meta-analysis. *J Ovarian Res*. 2024 May 17;17(1):104. doi: 10.1186/s13048-024-01423-2.