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Ovarian Rejuvenation by the Autologous Platelet-rich Plasma: Current Status and Future Scope

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Dear Editor,

Autologous platelet-rich plasma (PRP) injection into the ovaries is a newly introduced procedure for purpose of ovarian rejuvenation. It may be helpful in upgrading the fertility rate of in vitro fertilization (IVF) poor responders, including women with premature ovarian failure or diminished ovarian reserve.

In this procedure, the patient's fresh blood is centrifuged, and platelets-containing plasma is isolated (1). This plasma is full of growth factors, and its platelet concentration is more than whole blood (2). Vascular endothelial growth factors, epidermal growth factors, fibroblast growth factors, insulin-like growth factors, platelet-derived growth factors, transforming growth factors, and hepatocyte growth factors are found with high concentrations in PRP fraction (3).

PRP may cause tissue regeneration and have anti-inflammatory effects. It may perform homeostatic effects because of high concentrations of adenosine triphosphate, adenosine diphosphate, calcium ions, serotonin, histamine, dopamine, and healing effects because of sphingosine 1-phosphate, fibronectin, and vitronectin (4).

PRP was first introduced to the world in 1954. In 197n 0s it was utilized in sports medicine and after that in the skin, hair, cartilage, and autoimmune disorders (5). In 2016, in Greece, intraovarian PRP injection was published for the first time (6). Ovarian PRP injections may be done by laparoscopic approach or by a transvaginal ultrasound-guided intraovarian injection (7).

Follicular stimulation hormone (FSH), luteinizing hormone (LH), estradiol, and anti-Mullerian hormone (AMH) levels; follicular count; menstruation pattern changes and IVF outcomes before and after ovarian PRP are some data that have been reported in the studies. Some articles reported the benefits of this novel treatment in ovarian rejuvenation. Otherwise, the other citations reported no effective role (5, 8, 9). Since then, some pregnancies of menopausal women and poor responders have been reported following ovarian PRP injection (9).

It is not a long time since ovarian PRP has been used clinically; till now, there are no reports of any serious adverse effects associated with this procedure (8). However, its long-term adverse effects should be followed by cohort studies, such as the potential higher risk of malignancy because of high concentrations of growth factors injected into the ovarian tissue.

The few articles published about ovarian PRP till now vary in their inclusion criteria, time of injection, PRP volumes and if PRP is activated or not, the procedure utilized for injection, and the study design (5). There is a systematic review about the efficacy of intra-ovarian infusion of autologous PRP in patients with poor ovarian reserve or ovarian insufficiency that is published in 2020. Just four articles were included in this systematic review by the eligibility criteria. Their study shows that ovarian PRP may be a hopeful procedure for those poor responders who are willing to have a biological child because of its good outcomes like better mature oocyte yield, higher fertilization rate, and good-quality embryos (10).

At least at the moment, ovarian PRP treatment is not applicable as a standard fertility procedure, most of all because of the lack of strong investigations and acceptable controlled trials about this novel procedure. In our opinion, this novel procedure should be documented more and more in intelligently planned investigational research settings before its general use in infertility clinics. We recommend designing further randomized clinical trials and cohort studies to answer the questions about the effectiveness of ovarian PRP on live birth rate, clinical pregnancy

rate, and about ovarian PRP adverse outcomes before establishing this procedure as a routine infertility treatment program in the future.

Footnotes

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