Republic Of Iraq

Ministry Of High Education And Scientific Research

University Of Diyala

Collage Of Medicine

Other application use to increase the rate of success IVF/ICSI in implantation failure new concept of PRP

By:-

Shams ammar jamel

SUPERVISED By:-

Prof. Dr. Ali hassan Alhussaini

2020-2021

Contents

Dedication

All thanks to Allah his majesty for helping me to complete this work and enabling me to accomplish this stage of my life

It is a great pleasure to dedicate this work with my thanks and respect to my supervisor Prof. Dr. Ali Alhussaini for his valuable instruction

And I dedicate this work to my family

To my Father and mother

for their big support with great respect, for their endless love and encouragement

To my sister

for being beside me and always helped me and believed that I could do it

To my Fiance

who always encourage me with passion and endless love, support and always stand beside me. I am so Lucky to have him in my life

to my best friends Juman and Lubna

for being always beside me

And to all those who support me throughout my life (my family, my friends and all my colleagues).

Acknowledgment

I sincerely express my gratitude to my supervisor Prof. Dr. Ali Alhussaini for suggesting this article review, his great support, guidance, patience, continuous generous help and fruitful scientific instructions throughout the course of article. It was the greatest thing to work under his supervision. Deep gratitude and special thanks to all the teaching staff of Diyala College of Medicine for their scientific lectures and practical assistance

Abstract

In vitro fertilization (IVF) is the method of obtaining eggs from a woman and sperm from a male and fertilizing them in the embryology laboratory. In order to maximize probability of fertilization, a single sperm is inserted into each of the harvested eggs using a precision needle in a procedure called intra-cytoplasmic sperm injection (ICSI). In a variety of cases, ICSI has been shown to increase the fertilization rate.

Since its introduction in 1978, in vitro fertilization, also known as IVF, has caught the public's attention. Much of the civilized world now has access to assisted reproductive technology, which is vastly different from what was used in the past. IVF has evolved into a medical technique that is reliable, secure, easily available, and relatively inexpensive as laboratory technology and clinical practice have improved. To date, more than 2 million IVF babies have been born, and continued improvements are likely to broaden the appeal and applicability of the procedure.

Induction of ovulation, fertilization of the oocyte, and development of embryos transferred into the uterus are the three basic components of in vitro fertilization. At either of these intersections, problems can occur, resulting in failure. The World Congress on In Vitro Fertilization was conducted in 1984, and researchers looked at 9,641 laparoscopies that resulted in 1,101 clinical births, with an average pregnancy rate of 11%—clearly showing that in vitro fertilization/embryo transfer (IVF/ET) was a concept whose time had come.Ultrasound and frequent estradiol levels are used to track ovulation induction, with ultrasound suggesting the amount of oocytes eligible for capture and estradiol indicating the efficiency of such oocytes in an indirect way. Obtaining at least four embryos is a big goal for each patient, since this improves success rates .A high-dose human menopausal gonadotropin (HMG)/human chorionic gonadotropin (HCG) regimen is used at Yale to induce ovulation.This regimen has resulted in a 17 percent clinical pregnancy success rate per laparoscopy. Cryopreservation of oocytes and embryos, as well as gamete manipulation, will be used in the future to modify the procedure. The changes will specifically be made to raise fertility rates.

RIF (repeated implantation failure) is a big problem in reproductive medicine due to poor endometrial lining. The aim of this research is to see how intrauterine

platelet-rich plasma (PRP) therapy affects frozen-thawed embryo transfer (FET) cycles in patients with unexplained infertility and a history of RIF whose endometrium was unable to reach adequate lining.

Introduction of in vitro fertilization

Assisted reproductive technology (ART) refers to procedures that include manipulating oocytes outside of the body, the most common of which is in vitro fertilization (IVF). Since oocytes mature in vivo in the ovary and embryos grow into pregnancy in the uterus, the word "in vitro" refers to fertilization of the oocytes outside of a living organism. The first live birth from IVF was recorded in July 1978 in England by Robert Edwards, Ph.D., and Patrick Steptoe, MD. Dr. Edwards was awarded the Nobel Prize in Medicine for this achievement in 2010.[(1)]

The field of reproductive endocrinology/infertility (REI) has advanced steadily since this significant advancement in the treatment of infertility, and IVF currently accounts for 1.6 percent and 4.5 percent of all live births in the US and Europe, respectively. IVF was initially used to treat infertility caused by permanent tubal disease, but it is now commonly used to treat infertility caused by a number of factors, including endometriosis, male factor, and unexplained infertility. Women who are unable to use their own oocytes due to primary ovarian insufficiency (POI) or age-related oocyte loss will now become pregnant using donor oocyte IVF.[(2)]

The aim of this article review is The trial of use platelet rich plasma (PRP) in management of recurrent implantation failure (RIF) in in vitro fertilization (IVF) procedure.

Keywords

(PRP) platelet rich plasma,(IVF) in vitro fertilization ,(RIF) recurrent implantation failure

Preparation

Individuals who are considering IVF undergo a series of tests before beginning the treatment period. Cycle day three follicle-stimulating hormone (FSH) and estradiol (E2), anti-Mullerian hormone (AMH), or antral follicle count are both used to measure a woman's ovarian reserve. If the woman's ovarian reserve is found to be low based on all of these factors, she may still try IVF, but she will need to start using donor oocytes.[(1)]

Based on sperm morphology, count, and motility, the male partner undergoes a semen analysis to determine whether ICSI is necessary. use uterian cavity image to

identifies Some anatomical problems, such as endometrial polyps or fibroids, adhesions, or septa, that may interfere with embryo implantation are detected using uterine cavity imaging. Both partners should be tested for HIV, hepatitis B and C, and syphilis.[1]

Technique

Controlled Ovarian Stimulation

Ovarian stimulation is the first step in the in vitro fertilization process. There have been a variety of procedures used, ranging from no stimulation to varying amounts of ovarian stimulation utilizing clomiphene citrate, letrozole, and exogenous gonadotropins (FSH and LH). Gonadotropin-releasing hormone (GnRH) analogs are used in IVF cycles to suppress the woman's LH surge, enabling doctors to time oocyte retrieval. Transvaginal ultrasonography is used to monitor follicular development, and blood levels of E2 are used to decide whether the stimulation protocol needs to be changed. The oocyte is retrieved before the mid-cycle LH surge occurs in natural cycle IVF, or a GnRH antagonist (GnRHant) is used to avoid LH release. When the lead follicle has reached maturity, hCG is used to replace the LH surge. The pregnancy rate is about 8% per cycle, with a cumulative rate of 21% after three cycles in couples with male factor infertility, and rates as high as 44% in couples with female factor infertility. Because of the lower clinical pregnancy rate, natural cycle IVF is not widely used.[3] The vast majority of IVF cycles provide ovarian stimulation, which results in the retrieval of 10 to 20 oocytes. Long luteal GnRH agonist (GnRHa) or GnRHant cycle are the two major protocols. The long luteal GnRHa regimen starts with a daily dose of 0.1 mg GnRHa beginning on cycle day 21 of the previous month. During ovarian stimulation, the pituitary secretion of LH (and FSH) is turned off, and GnRHa is maintained until the hCG injection. Gonadotropins are injected daily at doses ranging from 75 to 450 IU, with dose changes dependent on follicular growth and estradiol levels, beginning on cycle day 2. When at least three follicles have grown to the size of 18 mm, the hCG injection is given. Starting on cycle day 2 or 3, the GnRHant protocol involves the administration of regular gonadotropins (75 to 450 IU). When the lead follicular diameter exceeds 14 mm or on the sixth day of ovarian stimulation, the GnRHant is started to block the endogenous LH surge. 18 mm h when at least three follicles have reached.[4]

Clomiphene citrate, a selective estrogen receptor modulator (SERM), or letrozole, an aromatase inhibitor, with or without gonadotropins, are used in the minimal stimulation regimen. The cost to the couple is minimized when gonadotropin stimulation is reduced or eliminated. The minimal stimulation protocol is gaining popularity, as studies indicate that although the live birth rate is marginally lower (49 percent vs. 63 percent), there are substantially lower rates of ovarian hyperstimulation syndrome and multiple pregnancies as compared to the long GnRHa protocol. [5]

Oocyte Retrieval

Mature oocytes are retrieved 34 to 36 hours after hCG administration, regardless of the stimulation protocol. Ultrasound-guided transvaginal aspiration and intravenous sedation are used to retrieve the oocytes. A vaginal ultrasound probe is used to visualize the ovaries, and an attached needle guide assists the physician in directing the needle through each follicle and aspirating the oocyte and follicular fluid.[4]

Embryo Fertilization

The oocytes are fertilized using insemination or ICSI. The sperm sample is prepared by density centrifuging the sperm and washing it in media with a high protein concentration to facilitate capacitation, which is required for sperm to become fertilizable. For 12-18 hours, 50,000 to 100,000 sperm are incubated with an oocyte. Male factor infertility can necessitate ICSI, which involves injecting one immobilized sperm directly into the oocyte. The sperm do not have to enter the zona pellucida, the glycoprotein matrix that surrounds the oocyte, as a result. [4]

Embryo Transfer

Fertilized embryos are transferred at the blastocyst stage (5 days after fertilization) or at the cleavage stage (3 days after fertilization). The blastocyst stage transfer results in more live births per cycle and lower multiple gestation rates because it uses less embryos. However, because of the loss of embryos that did not survive in culture until day 5, the blastocyst stage transfer may result in less embryos being available for transfer.[6]

Embryos are transferred into the uterus through a catheter that passes through the cervix under transabdominal ultrasound guidance. The embryo(s) are implanted 1 to 2 centimeters away from the uterine fundus. The catheter is examined under a microscope after the transfer to ensure that no embryos remain in the catheter and that all embryos were successfully implanted in the uterus. The number of embryos

transferred is determined by the embryo stage, quality of the embryo, maternal age, and patient preference. The American Society for Reproductive Medicine recommends moving no more than two blastocysts in women under 37 years old, no more than three blastocysts in women 38 to 40 years old, Owing to the lower probability of successful implantation, more cleavage stage embryos may be transferred; no more than two embryos in women under 35 years of age, no more than three embryos in women 35 to 37 years of age, no more than four embryos in women 38 to 40, and five or fewer embryos in women 41 to 42 years of age. Progesterone supplementation is started on the day of oocyte extraction or embryo transfer to improve embryo implantation and keep the pregnancy going. Cryopreservation is used to store excess good-quality embryos for potential use.[7]

use of EmbryoGlue

- EmbryoGlue is a hyaluronan-enriched embryo transfer (ET) medium that increases pregnancy rates in IVF-ET cycles by assisting embryo implantation (IVF-ET). [8]
- According to a 2012 report, embryo glue does not increase pregnancy outcomes in women who have failed previous IVF cycles. [9]
- EmbryoGlue as a HA-enriched ET medium for cleavage stage embryos has no benefit over the traditional medium for infertile patients undergoing ART, according to a study published in 2015. [10]

Endometrial Scratching (burrow)

Following the discovery of more studies, to measure the final value or gain of scratching in implantation, pregnancy, and live birth rates, it's vital to first identify the patient population that will benefit from the procedure. Scratching can increase the endometrium's receptivity, but implantation failure can also be caused by a variety of other pathologies. Unselected, subfertile women benefit less from endometrial scratching, according to the latest analysis of studies. Scratching, on the other hand, tends to be a promising method for improving the chances of implantation in women who have repeated implantation failure. Scratching is useful after the women have been adequately details about the treatment, scratching could be given to patients with chronic implantation failure in the hopes of improving pregnancy and live birth rates. Finally, endometrial scratching did not show any benefit in pregnancy or live birth rate,

and studies concluded that this procedure should no longer be provided, and patients should be informed of this. [8, 9]

Effect of hysteroscopy on in-vitro fertilization

HSC increased the implantation rate and clinical pregnancy rates in women with RIF undergoing IVF, but failed to increase the live birth rate and had no effect on the miscarriage rate, according to a 2019 report. and more research is needed because HSC plays a significant role in the pregnancy and birth outcomes of women with RIF. [10]

Recurrent implantation failure is characterized as a failure to achieve a clinical pregnancy after transfer of 4 or more good-quality embryos in a minimum of 2 in vitro fertilization (IVF) cycles in a woman under the age of 40, according to another study published in 2018. Embryo or uterine causes may be to blame for implantation failure. Many specialists in the field of IVF have long been perplexed by repeated implantation failure (RIF), which has been attributed not only to the embryos but also to a decline in endometrial receptivity. Endometrial thickness inadequacy, adhesions, and structural defects have all been related to problems with the uterine cavity. Uterine pathologies, such as Endometrial hyperplasia, polyps, and leiomyomata have been found in 18 percent to 50 percent of women who have had recurrent IVF failures.[11-13]

Noninvasive methods that have fair precision are available to diagnose the status of a uterine cavity. In the investigation of patients with RIF, vaginal ultrasonography, sonohysterography, and hysterosalpingography (HSG) are common procedures. Patients end up in RIF if any of the above tests come back regular, which frustrates both the patient and the IVF consultants since certain pathologies are overlooked in routine radiological evaluations.[14, 15]

Hysteroscopy was recently added to the armamentarium in the investigation of RIF, when several doctors started concentrating on the uterine cavity and correcting any intrauterine pathologies that had gone unnoticed. According to studies, a hysteroscopy's precision is superior to other modalities for diagnosing intrauterine pathologies.[14, 16, 17]

Introduction about use platelet rich plasma in IVF

An adequate embryonic development in conjunction with a receptive endometrium is needed for successful embryo implantation. Enough endometrial growth is needed for successful implantation in clinical practice. At the end of the follicular process, a minimum endometrial thickness of 7 mm is required for embryo transfer In assisted reproductive technology (ART), thin endometrium that is insensitive to standard therapies is still an issue, resulting in cycle cancellation and unplanned embryo cryopreservation. Various strategies have been developed for the treatment of thin endometrium, including extended use of exogenous estrogen, use of low-dose aspirin , vitamin E, and vaginal sildenafil citrate, electroacupuncture and application of granulocyte colony stimulation factor (G-CSF). However, a number of women with thin endometrium remain non-responsive even these remedies have been performed.[18] [19] [20] [21] [22] ,[23] [24]

Platelet-rich plasma (PRP) is made from fresh whole blood drawn from a peripheral vein, preserved in an anticoagulant called acid citrate dextrose solution A (ACD-A), and treated to raise platelets by separating different blood components.[19] Cytokines and growth factors (GFs) become bioactive after platelets are activated in PRP and secreted within 10 minutes of clotting. Vessel endothelial growth factor (VEGF), transforming growth factor (TGF), platelet-derived growth factor (PDGF), and epidermal growth factor are examples of these factors (EGF).[20]They can control cell migration, attachment, proliferation, and differentiation, as well as facilitate the deposition of extracellular matrix. PRP is also commonly used to improve tissue regeneration in a variety of therapeutic settings, including orthopedics, ophthalmology, and wound healing. However, there is no information on the use of PRP in the treatment of thin endometrium. The aim of this research was to see whether PRP could help infertile women with thin endometrium (less than 7 mm).[21]

What is add-on treatment?

consider the following: [21]

1. Infertility management supplement.

2. They aren't successful and there isn't enough research to back them up.

3. It's likely that it's connected to any threats that aren't yet known.

Examples

consider In the following:-[22]

1. Intra Cytoplasmic Sperm Injection (IMSI)
2. PICSI;
3. Human chorionic gonadotropin (chg.) injections into the uterus
4. Reproductive immunology tests and treatment
5. Embryo glue
6. Endometrial scratching
7. PGS
8. Time-lapse imaging

What is PRP?

PRP has a 3 to 5 times greater platelet concentration than whole blood. PRP contains a lot of plasma proteins, growth factors, and cytokines.[22]

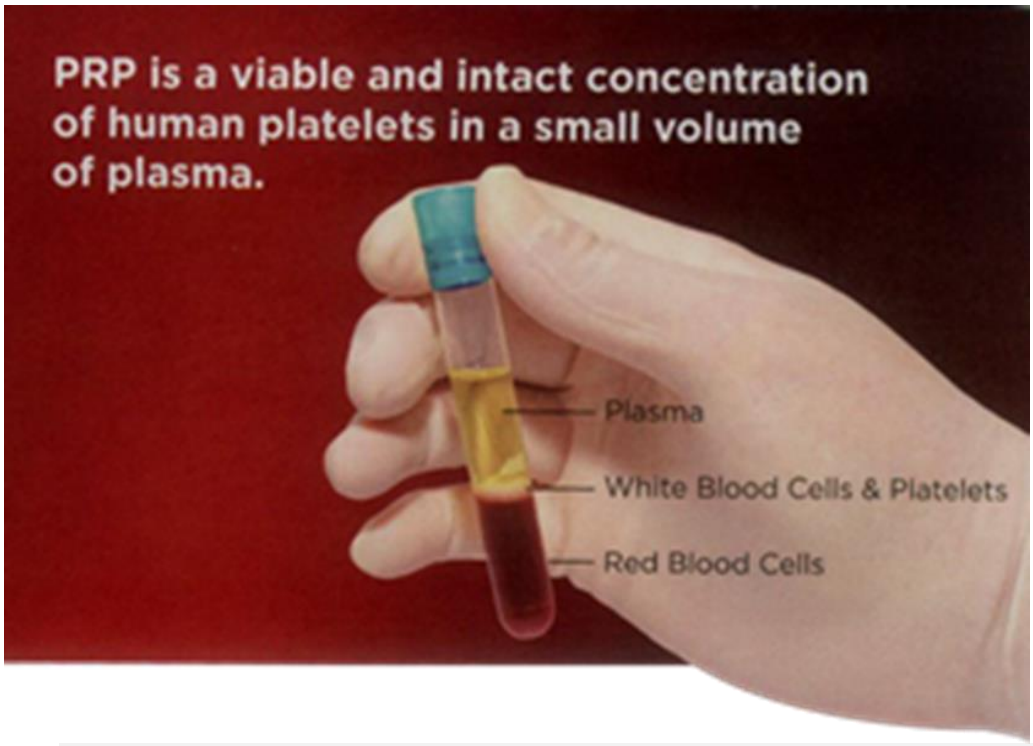
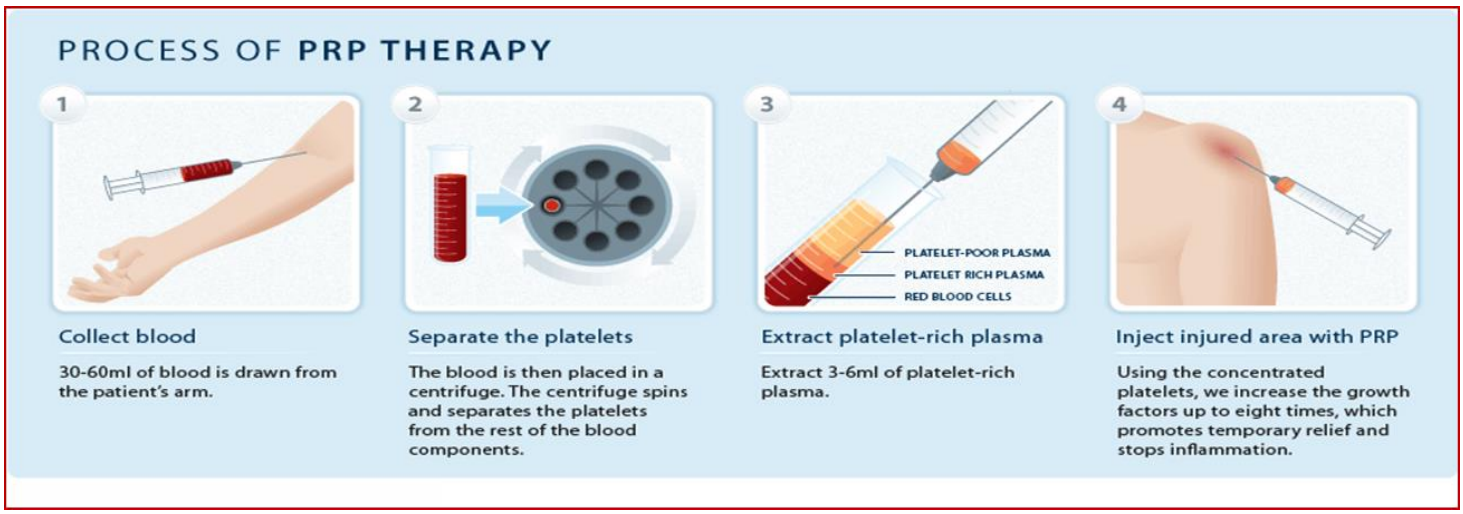


Fig.(1) PRP is a viable and intact concentration of human platelet within a small volume of plasma[22]



fig(2) PRP- Preparation[22]

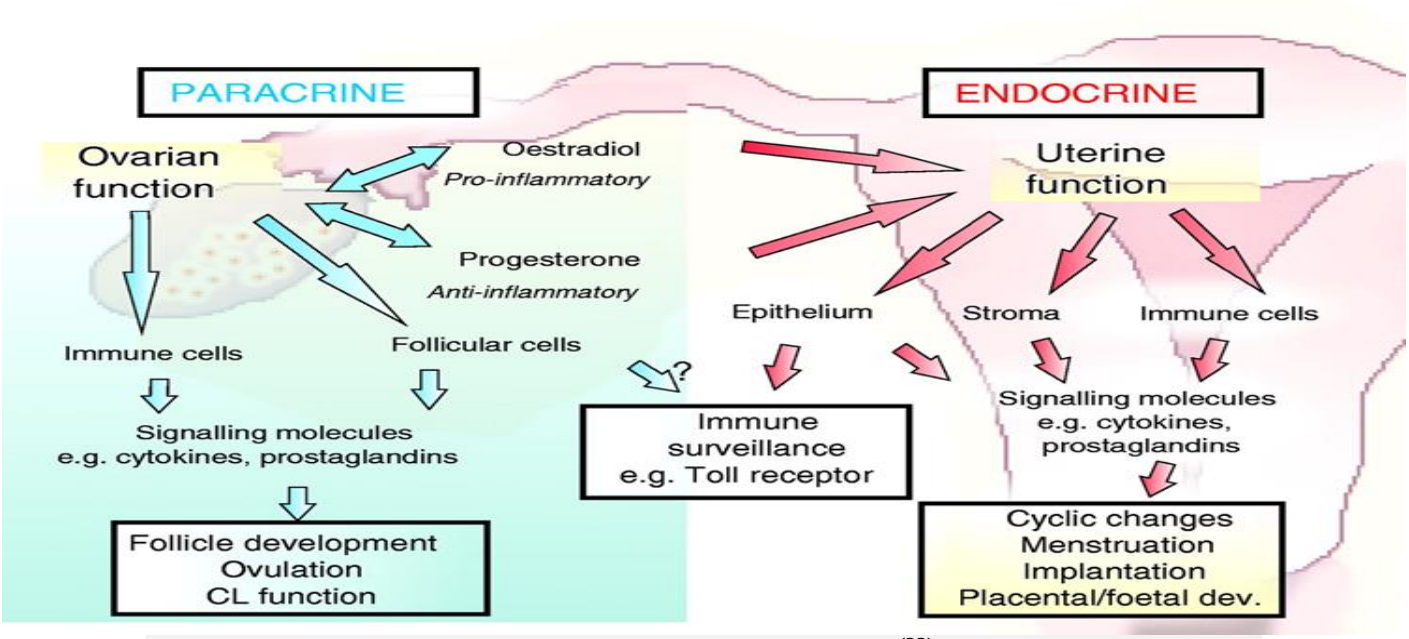
Role in IVF

consider in the following:- [22]

1. Implantation
2. Thin endometrium
3. POI

Implantation

PRP increase the expression of adhesion molecules on the endometrial surface, increasing the chance of an implantation.[22]



Fig(3) endocrine and paracrine[22]

Intrauterine infusion of autologous PRP in women undergoing IVF:in Feb.,2020 Ameta-analysis . [22]

- 625 women.
- clinical pregnancy (RR: 1.79, 95 % CI: 1.37, 2.32; P < 0.001).
- endometrial thickness increased (SMD: 1.79 mm, 95 % CI: 1.13, 2.44; P < 0.001).

Effect of PRP on pregnancy in women with RIF: a RCT in (May 2020) [22,23]

- 98 women.
- clinical pregnancy (48.3% versus 23.26; p = 0.001).
- ongoing pregnancy (46.7% versus 11.7%; p = 0.001) .
- implantation rate (58.3% versus 25%; p = 0.001.

Effects of autologous PRP in RIF: a RCT in (September, 2020) [23]

- 97 women.
- chemical pregnancy rate was higher within the PRP group than control group (53.06 percent versus 27.08 percent, respectively, p value: 0.009).
- The clinical pregnancy rate in the PRP group was higher than in the control group (44.89 percent versus 16.66 percent, respectively; p value: 0.003).

Thin endometrium

- defined as <7 mm on day of hCG. [22]
- PRP supplies supra physiologic amounts of essential growth factors to provide a regenerative stimulus for promoting tissue repair. [22]

Mostly uncontrolled small trials

- For example, a trial of only 10 women was published in 2017 Endometrial thickness increased >7 mm after 2 injections of PRP 48 hours apart. [23]
- ET was carried for all of them 5 patients were pregnant (50%). 4 of them continued their pregnancy normally. [23]

All Positive results [23, 24]

All showed highly significant improvement in endometrial thickness ($P < 0.01$)

- All were in FET.
- All were done 48 hrs. before E.T.
- All reported higher pregnancy rate.
- So we should be very cautious.

PRP in premature ovarian Insufficiency

in the ESHRE (2016) at Helsinki finland, injected 8 perimenopausal women with PRP in 1 to 3 months all cases undergone natural IVF cycles with resulting follicles of 15.2±2.5 mm in diameter, all were inseminated by ICSI & all embryos were cryopreserved. [24]

Live Birth in Woman With POI Receiving Ovarian Administration of PRP in Combination With Gonadotropin: in Feb 2020 [25, 26]

- A single dose of autologous PRP (extracted from 40 mL of peripheral blood) was inserted into the stroma of bilateral ovaries, along with gonadotropin (150IU rFSH/75IU rLH).
- ICSI was done later.

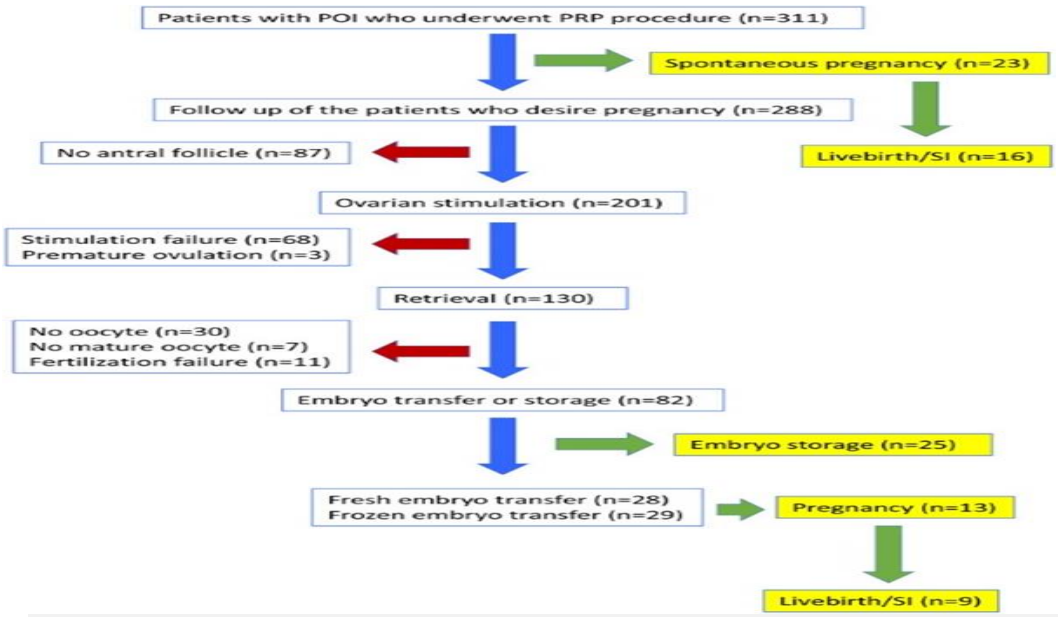


Fig.4 Intraovarian injection of autologous PRP on ovarian reserve and IVF outcome in women with POI.[25]

Ganna experience 2019-2020 [25]

- Inclusion criteria:.
    - Age below 40.
    - FSH: 20-30.
    - BMI <30.
    - still menstruating.
- 2019: Intraovarian injection was done TVS.
- 2020: Intraovarian injection was done Laparoscopically.

Follow up [24,25]

- 6 month.
- Blood assay E2.
- Start stimulation with Gn within one month.
- 7 days Gn / cycle for 6 month Outcome : POI
- TVS injection was done in 9 cases with premature ovarian insufficiency.
- Menses still occur.
- Unfortunately, no follicles were developed to be retrieved (4 discontinued).
- E2 assay was always less than 100.

Study in 2020 [24]

- Laparoscopic intraovarian injection was done for 7 cases
- Follow up is still continued.
- Results: disappointing: only one case developed follicle (OPU was done but was empty follicle).
- No pregnancy.

Thin endometrium : Ganna [25]

- Intrauterine infusion of PRP has been conducted for women with thin endometrium (<5 mm) on cycle day 12-14.
- Over 2019-2020 almost 27 women were injected with PRP .
- this was followed by adjuvants as estradiol supplementation or Gn injections.

Outcome

- Significant improvement was achieved in 16 cases and FET was done.
- Pregnancy was achieved in only 2 cases.
- 11 were refractory and remain thin.

Subendometrial injection

consider In the following [24]

- Injection of PRP in the subendometrial niche.
- Using OPU needle (under U/S).
- Blood sample 20 cc blood.
- Injection in both layers (anterior & posterior).

Outcome [24]

- Among the 11 cases, 5 showed improvement in endometrial thickness .
- 3 of them got FET, 2 drop out.
- No pregnancy.
- Remaining 6 cases still having their embryos frozen.

Conclusion

- Need more studies to conclude that is the PRP to be documented in the guidelines in ART (assisted reproductive technology.
- All the articles and studies found in the all area related to the world of IVF are not confirm because the data still small but it is promising subject .

Refernces :-

1. Zhao Y, Brezina P, Hsu C-C, Garcia J, Brinsden PR, Wallach E. In vitro fertilization: four decades of reflections and promises. Biochimica et Biophysica Acta (BBA)-General Subjects. 2011; 1810(9): 843-52.
2. Sunderam S, Kissin DM, Crawford SB, Folger SG, Boulet SL, Warner L, et al. Assisted reproductive technology surveillance—United States, 2015. MMWR Surveillance Summaries. 2018; 67(3): 1.
3. Pelinck M, Vogel N, Arts E, Simons A, Heineman M, Hoek A. Cumulative pregnancy rates after a maximum of nine cycles of modified natural cycle IVF and analysis of patient drop-out: a cohort study. Human reproduction. 2007; 22(9): 2463-70.
4. Zhang JJ, Merhi Z, Yang M, Bodri D, Chavez-Badiola A, Repping S, et al. Minimal stimulation IVF vs conventional IVF: a randomized controlled trial. American journal of obstetrics and gynecology. 2016; 214(1): 96. e1-. e8.
5. Shrestha D, La X, Feng HL. Comparison of different stimulation protocols used in in vitro fertilization: a review. Annals of translational medicine. 2015; 3(10).
6. Glujovsky D, Farquhar C, Retamar AMQ, Sedo CRA, Blake D. Cleavage stage versus blastocyst stage embryo transfer in assisted reproductive technology. Cochrane database of systematic reviews. 2016(6).
7. Medicine PCotASfR. Electronic address ASRM@ asrm. org. Practice Committee of the Society for Assisted Reproductive Technology. Penzias A, Bendikson K, Butts S, Coutifaris C, Fossum G, Falcone T, et al. Guidance on the limits to the number of embryos to transfer: a committee opinion. Fertil Steril. 2017; 107(4): 901-3.
8. Lensen S, Osavlyuk D, Armstrong S, Stadelmann C, Hennes A, Napier E, et al. A randomized trial of endometrial scratching before in vitro fertilization. New England Journal of Medicine. 2019; 380(4): 325-34.
9. Vitagliano A, Noventa M, Saccone G, Gizzo S, Vitale SG, Lagana AS, et al. Endometrial scratch injury before intrauterine insemination: is it time to re-evaluate its value? Evidence from a systematic review and meta-analysis of randomized controlled trials. Fertility and sterility. 2018; 109(1): 84-96. e4.
10. Mao X, Wu L, Chen Q, Kuang Y, Zhang S. Effect of hysteroscopy before starting in-vitro fertilization for women with recurrent implantation failure: a meta-analysis and systematic review. Medicine. 2019; 98(7).
11. Kogan L, Dior U, Chill HH, Karavani G, Revel A, Shushan A, et al. Operative hysteroscopy for treatment of intrauterine pathologies does not interfere with later endometrial development in patients undergoing in vitro fertilization. Archives of gynecology and obstetrics. 2016; 293(5): 1097-100.
12. Moini A, Kiani K, Ghaffari F, Hosseini F. Hysteroscopic findings in patients with a history of two implantation failures following in vitro fertilization. International journal of fertility & sterility. 2012 ;6(1): 27.
13. Al-Turki HA, Gullenpet AH, Syed A, Al-Saif HS, Aldhafery BF. Uterine and tubal abnormalities in infertile Saudi Arabian women: A teaching hospital experience. Saudi journal of medicine & medical sciences. 2016; 4(2): 89.
14. Vitner D, Filmer S, Goldstein I, Khatib N, Weiner Z. A comparison between ultrasonography and hysteroscopy in the diagnosis of uterine pathology. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2013; 171(1): 143-5.
15. Chawla I, Tripathi S, Vohra P, Singh P. To evaluate the accuracy of saline infusion sonohysterography (SIS) for evaluation of uterine cavity abnormalities in patients with abnormal uterine bleeding. The Journal of Obstetrics and Gynecology of India. 2014; 64(3): 197-201.

16. Khan F, Jamaat S, Al-Jaroudi D. Saline infusion sonohysterography versus hysteroscopy for uterine cavity evaluation. Annals of Saudi medicine. 2011; 31(4): 387-92.
17. Zinna M, Gentile M, Torcia F, Bianchi P, Cozza G, Marziani R, et al. Diagnostic accuracy of sonohysterography vs hysteroscopy in benign uterine endocavitary findings. Eur Rev Med Pharmacol Sci. 2015; 19(3): 365-71.
18. Gleicher N, Vidali A, Barad DH. Successful treatment of unresponsive thin endometrium. Fertility and sterility. 2011; 95(6): 2123. e13-. e17.
19. Amable PR, Carias RBV, Teixeira MVT, da Cruz Pacheco Í, do Amaral RJFC, Granjeiro JM, et al. Platelet-rich plasma preparation for regenerative medicine: optimization and quantification of cytokines and growth factors. Stem cell research & therapy. 2013; 4(3): 1-13.
20. Lee JW, Kwon OH, Kim TK, Cho YK, Choi KY, Chung HY, et al. Platelet-rich plasma: quantitative assessment of growth factor levels and comparative analysis of activated and inactivated groups. Archives of plastic surgery. 2013; 40(5): 530.
21. Dhillon RS, Schwarz EM, Maloney MD. Platelet-rich plasma therapy-future or trend? Arthritis research & therapy. 2012; 14(4): 1-10.
22. Hosseini L, Shirazi A, Naderi MM, Shams-Esfandabadi N, Boroujeni SB, Sarvari A, et al. Platelet-rich plasma promotes the development of isolated human primordial and primary follicles to the preantral stage. Reproductive biomedicine online. 2017; 35(4): 343-50.
23. Melo P, Navarro C, Jones C, Coward K, Coleman L. The use of autologous platelet-rich plasma (PRP) versus no intervention in women with low ovarian reserve undergoing fertility treatment: A non-randomized interventional study. Journal of assisted reproduction and genetics. 2020:1-9.
24. Javaheri A, Kianfar K, Pourmasumi S, Eftekhar M. Platelet-rich plasma in the management of Asherman's syndrome: An RCT. International Journal of Reproductive BioMedicine. 2020; 18(2): 113.
25. Sfakianoudis K, Simopoulou M, Grigoriadis S, Pantou A, Tsioulou P, Maziotis E, et al. Reactivating ovarian function through autologous platelet-rich plasma intraovarian infusion: pilot data on premature ovarian insufficiency, perimenopausal, menopausal, and poor responder women. Journal of Clinical Medicine. 2020; 9(6): 1809.
26. Hsu C-C, Hsu L, Hsu I, Chiu Y-J, Dorjee S. Live birth in woman with premature ovarian insufficiency receiving ovarian administration of platelet-rich plasma (PRP) in combination with gonadotropin: a case report. Frontiers in endocrinology. 2020; 11.

نبذة مختصرة

الإخصاب في المختبر هو طريقة للحصول على بويضات من امرأة وحيوانات منوية من ذكر وتخصيبها في مختبر علم الأجنة. من أجل تعظيم احتمالية الإخصاب ، يتم إدخال حيوان منوي واحد في كل بويضة محصودة باستخدام إبرة دقيقة في إجراء يسمى حقن الحيوانات المنوية داخل السيتوبلازم ICSIفي مجموعة متنوعة من الحالات ، ثبت أن الحقن المجهري يزيد من معدل الإخصاب.

منذ تقديمه في عام 1978 ، جذب الإخصاب في المختبر ، المعروف أيضًا باسم التلقيح الاصطناعي ، انتباه الجمهور. يتمتع الكثير من العالم المتحضر الآن بإمكانية الوصول إلى تقنية المساعدة على الإنجاب ، والتي تختلف اختلافًا كبيرًا عما تم استخدامه في الماضي. لقد تطور التلقيح الاصطناعي إلى تقنية طبية موثوقة وآمنة ومتاحة بسهولة وغير مكلفة نسبيًا حيث تحسنت تكنولوجيا المختبرات والممارسات السريرية. حتى الآن ، وُلد أكثر من مليوني طفل من أطفال الأنابيب ، ومن المرجح أن تؤدي التحسينات المستمرة إلى توسيع نطاق الاستئناف وإمكانية تطبيق الإجراء.

تحريض الإباضة ، وتخصيب البويضة ، وتطوير الأجنة المنقولة إلى الرحم هي المكونات الأساسية الثلاثة للتخصيب في المختبر. في أي من هذه التقاطعات ، يمكن أن تحدث مشاكل ، مما يؤدي إلى الفشل. تم عقد المؤتمر العالمي حول الإخصاب في المختبر في عام 1984 ، ونظر الباحثون في 9641 عملية تنظير للبطن أسفرت عن 1101 ولادة سريرية ، بمتوسط معدل حمل 11٪ - مما يدل بوضوح على أن الإخصاب في المختبر / نقل الأجنة كان المفهوم الذي حان وقته: يتم استخدام الموجات فوق الصوتية ومستويات الاستراديول المتكررة لتتبع تحريض الإباضة ، حيث تشير الموجات فوق الصوتية إلى كمية البويضات المؤهلة للالتقاط والإستراديول مما يشير إلى كفاءة هذه البويضات بطريقة غير مباشرة. إن الحصول على أربعة أجنة على الأقل هو هدف كبير لكل مريض ، لأن هذا يحسن معدلات النجاح. يتم إجراء تحريض الإباضة في جامعة ييل بجرعة عالية من موجهة الغدد التناسلية البشرية بعد انقطاع الطمث نظام موجهة الغدد التناسلية المشيمية البشرية نتج عن هذا النظام معدل نجاح الحمل بنسبة 17 بالمائة لكل منظار البطن. سيتم استخدام الحفظ بالتبريد للبويضات والأجنة ، وكذلك التلاعب بالأمشاج ، في المستقبل لتعديل الإجراء. سيتم إجراء التعديلات بشكل أساسي لزيادة معدلات الحمل.

فشل الزرع المتكررمشكلة كبيرة في الطب التناسلي بسبب ضعف بطانة الرحم. الهدف من هذا البحث هو معرفة كيف يؤثر علاج البلازما الغنية بالصفائح الدموية داخل الرحم على دورات نقل الأجنة المجمدة المذابة في المرضى الذين يعانون من العقم غير المبرر وتاريخ الذين لم يتمكن بطانة الرحم من الوصول إلى البطانة المناسبه .