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Effects of PRP Intratesticular Injection in Non-Obstructive Azoospermic Infertile Men Spermatogenesis and Reproductive Hormonal Levels (FSH and LH).

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ABSTRACT

Non-obstructive azoospermia (NOA) is the absence of sperm in infertile men ejaculate as a result of significant spermatogenesis defects or hormonal malfunction. PRP intratesticular injection may be employed in assisted reproductive technology as a therapeutic effect for this problem. The aim is to assess the level of spermatogenesis and reproductive hormones after PRP autologous intratesticular injection. 50 non-abstructive azoospermia infertile men participated in the current study. The patients were given an intra-testicular injection of platelet-rich plasma using a 1 ml syringe; FSH LH hormonal levels were estimated; if there was no sperm count, the patient should be prepared for a testicular biopsy by the expert doctor. Small number of sperm may be discovered during a biopsy while the testes are being examined in the lab. The therapeutic benefits were seen in 15 patients 3-4 months after using autologous platelet-rich plasma. The results showed that there was a highly significant difference in FSH and LH hormonal levels after PRP injection P(0.001). PRP can help non-obstructive azoospermic infertile males with their testis' structural and functional dysfunction.

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KEYWORDS

NOA (Non-Obstructive Azoospermia) Azoospermia, and Platelet Rich Plasma,

1. Introduction

Men and women can both experience infertility, and both can have an impact on the patients who do. According to Kumar (2013), between 30% and 50% of infertile marriages involve men, and 10% of infertile men are found to have non-obstructive azoospermia, which is the inability of spermatogenesis due to either insufficient gonadotropin stimulation or a fundamental problem with the male reproductive system (Kumar [1] and Hendriks et al. [2]). Before hormone medicines and stem cell therapy, men with Non-Obstructive Azoospermia (NOA) had no other options for treatment if they wanted to conceive a biological child through assisted reproductive technology (ART) that exists today (Chang et al., [3]). PRP's potential advantages have also been researched in the area of gynecology; one study found PRP can thicken weak endometrium and enhance pregnancy outcomes. A high concentration of autologous platelets isolated in a small volume of plasma following centrifugation is known as platelet-rich plasma (PRP), also known as autologous platelet gel, plasma rich in growth factors (PRGF), and platelet concentrate (PC) (Wang HL and Avila G [4]). The platelets carry more than 800 different types of protein molecules, cytokines, hormones, and chemoattractants. (Pantos et al. [5]).

Platelet-rich plasma (PRP) injections in this study may also offer a possibility to treat males with non-obstructive azoospermic infertility (Gudelci et al. [6]). Testicular sperm extraction (TESE), an effective method to recover spermatozoal cells in patients with NOA, is one of the surgical procedures that have been established to retrieve sperm cells in men with NOA (Wang et al. [4] and Gardner et al. [7]). No human research on the potential benefits of PRP in NOA therapy has been done in Iraq, and little is known about the benefits of using PRP in testicles.

2. Patients, Materials, and Methods

The current study, which was conducted at the High Institute for Infertility Diagnosis and Assisted Reproductive Technologies/IVF Department at Al-Nahrian University in Iraq, included 50 non-abstractive azoospermia infertile men, with a mean age of 34±7.49. The inclusion and exclusion criteria for each patient included in this study are the same. Nonabstractive azoospermic infertile men are among the inclusion criteria, and the exclusion criteria were age 18 years and >55 years, primary hypogonadism or related testicular illnesses, residual adenoma, smoking, diabetes mellitus, and prior androgen replacement therapy. Before the surgery, the levels of testosterone and FSH were assessed. The institute lab was used to collect all of the study's necessary data. These studies' steps consist of:

• First, Using the PRP preparation process, 10 ml of fresh blood was drawn from a peripheral vein and placed into a Jell tube containing the anticoagulant Acid Citrate Dextrose solution A (ACD-A) (Chang Y, [3]).

• Second, Men had received PRP intra-testicular injections with 1 ml of platelet-rich plasma being injected into each testicle using a 1 ml syringe and fine needle under mild anesthesia. After one month from each platelet-rich plasma injection, if there was any response, there may be few sperm found in FSA; however, if there was no change in sperm count, the patients should take a date from the urologist doctor for doing Testicular biopsy, and adding autologous PRP. The injection has been repeated at least three times for three to four months. Just one month between each injection, FSH and Testosterone hormonal levels were analyzed.

• Third, when the biopsy material is examined under a microscope, sperm may occasionally be found. These sperm are then preserved using cryopreservation techniques in a freezing tank in preparation for use in

ICSI procedures in the future.

3. Statistical analysis:

For categorical variables, frequencies and percentages were used, whereas for continuous variables, means and standard deviations were used. By using paired samples t-tests, the statistical difference between the pre-procedure FSH, LH, and post-procedure FSH, LH for all was determined. Statistical Package for Social Science (SPSS), version 23, and Microsoft Office Excel 2010, along with a 95% confidence interval, were used to conduct the analysis. Number and percentage were used to express qualitative (categorical) variables, and Fisher exact test and Yates chi-square tests were used to compare these variables between groups. While paired t-tests were used to compare variables within the same group, unpaired t-tests were used to compare variables between different two groups, and ANOVA (analysis of variance) was used to compare variables among three groups. Quantitative (numeric) variables were expressed as mean (an index of central tendency) and standard deviation (an index of dispersion). The P-value of equal to or less than 0.05 was used to determine the degree of significance.

4. Results

The therapeutic effect of platelet-rich plasma was seen in 15 patients during the first three to four months after using autologous PRP, according to the procedure used by the specialist doctor for using the autologous PRP method.

The hormonal data demonstrate that there were extremely significant variations in the levels of the hormones FSH and luteinizing hormone after platelet-rich plasma injection (PRP) as compared to before PRP addition P (0.001) and P (0.001, respectively).

Table (1) shows was comparison of hormones before and after PRP injection in:

• Before PRP injection, the mean S.FSH hormone level was (28.96±6.72), while the mean S.FSH level after PRP injection was

(23.39±9.54). The S.FSH hormones' p value was extremely significant (p=0.001). Before PRP injection, the mean S. LH hormones were 9.76 4.25, and after PRP injection, they were 8.13 3.92. The S. LH hormone p value was significantly significant (P=0.006).

Table (1): **Comparison of hormones reproductive levels before and after PRP injection**

Hormones	Before PRP Injection Mean±SD	After PRP Injection Mean±SD	P Value
S. FSH (m iu/ml)	**28.96±6.72**	**23.37±9.54**	**<0.001HS**
S. LH (m iu/ml)	**9.76±4.25**	**8.13±3.92**	**0.006 HS**

n=50 Total Number of Patient, Paired T

5. Discussion

Table 1 demonstrates a substantial effect of PRP on the maintenance of reproductive hormones in patients with non-obstructive azoospermia, such as FSH and T. This conclusion concurs with Plant et al. explanation of the impact of FSH on Sertoli cell FSH receptors (an indirect effect of PRP through its effect on Sertoli cells), according to which the Sertoli cells are prompted by FSH to produce ABP (Plant et al [8]). Although higher spermatozoa production has been associated with higher FSH levels, Kraemer et al. explain that ABP plays a role in the development of the blood testis barrier and that T presumably is solely responsible for its maintenance. ABP also plays a critical role in concentrating testicular testosterone at the proper levels, which are crucial for the process of spermatogenesis and maintaining semen quality (Kraemer et al. [9]). According to the research of Plant et al., pulsatile GnRH release stimulates FSH secretion, which is also sensitive to changes in hypothalamic

frequency. All of these facts are compatible with the results of the current study. They also proposed that the secretion of FSH is tightly controlled via a negative feedback loop, notably by Sertoli cell peptides, inhibin B, and by limiting the activin activation of FSH gene expression (Plant et al. [8]). The current study found that PRP therapy improved hormone levels and spermatogenesis, bringing the FSH levels back into the normal range. This finding is similar to that of Al-Nasser et al., and the statistical difference between the initial FSH and post-procedure FSH for patients with primary and secondary spermatocytes was based on the male infertile observed

Infertile males with non-obstructive azoospermia who exhibit statistically significant levels of spermatogenesis activation have been the subject of numerous research evaluating the effects of PRP. One such study is Al-Nasser et al. The new study makes significant contributions to the initial evaluation of infertile males getting PRP therapy, improvement in terms of hormonal level and spermatogenesis in the initial FNA reports. (Al-Nasser et al, [10])

There was no evidence of any deteriorating effects of PRP therapy in this study, which is consistent with the high regenerative potential of PRP and the fact that the therapy poses no serious risks due to the use of the patient's own blood in its preparation.

A indicated in Table (1), the level of FSH before PRP therapy was higher than it was after, with significant effects. PRP can be managed near to its baseline value

helping to plan future management.

6. Conclusions

The therapeutic effect of platelet-rich plasma in male infertility was discovered by the results of 50 infertile men who participated in the current study. FSH may play a significant role in improving hormone levels and activating spermatogenesis, was shown in the current study to approach the

normal level following three PRP treatments. PRP can help non-obstructive azoospermic infertile males with their testis' structural and functional dysfunction.

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Conflict of Interest

The authors declare no conflict of interest.

Ethical Clearance

The study was approved by the Ethical Approval Committee.

References

[1] Kumar R. Medical management of non-obstructive azoospermia. Clinics (Sao Paulo)Feb.2013,68:75-79. Doi:10.6061/clinics/2013 (sup01)08.

[2] Hendriks S, Dancet EA, Meissner A, van der Veen F, Mochtar MH. Perspectives of infertile men on future stem cell treatments for nonobstructive azoospermia. Reprod Biomed Online May 2014, 28 (5):650657.13. Doi: 10.1016/j.rbmo.2014.01.011.

[3] Chang Y, Li J, Chen Y, Wei L, Yang X, et al. Autologous platelet-rich plasma promotes endometrial growth and improves pregnancy outcomes during in vitro fertilization. Int J Clin Exp Med 2015, 8 (1). 1286-1290.

[4] Wang HL, Avila G. Platelet Rich Plasma: Myth or Reality? Eur J Dent 1: Oct. 2007, 1 (4), 192-194.

[5] Pantos K, Nitsos N, Kokkali G, Vaxevanoglou T, Markomichali C, et al. (2016) Ovarian rejuvenation and folliculogenesis reactivation in peri-menopausal women after autologous platelet-rich plasma treatment. Jul. 2016,401. Doi.org/10.26226/morressier.573c1512d462b80296c98880

[6] Gudelci, M.D., Yigit Cakiroglu, M.D., Aysen Yuceturk, M.D, Bulent Tiras, M.D, Ali Rıza Kural, M.D., Emre Seli, M.D. The effect of intratesticular injection of autologous platelet-rich plasma (PRP) on sperm retrieval rates and IVF outcomes in men with non-obstructive azoospermia and history of failed testicular sperm extraction, Oct. 2021. V (116) p 538. Doi:https://doi.org/10.1016/j.fertnstert.2021.07.893.

[7] Gardner DK, Lane M, Watson AJ. A laboratory guide to the mammalian embryo. New York: Oxford University Press; Feb. 2004.p.76-85

[8] Plant TM, Marshall GR. The functional significance of FSH in spermatogenesis and the control of its secretion in male primates. Endocr Rev, Dec. 2001, 22 (6):p764-786. Doi: 10.1210/edrv.22.6.0446.

[9] Kraemer WJ, Rogol AD. The endocrine system in sports and exercise. Malden, Massachusetts: Blackwell Publishing; 2005. no. 30. p 978-1-4051.

[10] Al-Nasser R, Zakwan Khrait* and Samer,2018, The Effectiveness of Autologous Platelet-Rich Plasma (PRP) in the Therapy of Infertile Men with Non-Abstractive Azoospermia HSOA Journal of Reproductive Medicine, Gynecology. Sep. 2018, 3 (011). Doi:10.24966/RMGO-2574/100011.