

Evaluation of the Effectiveness and Outcome of Platelet Rich Plasma (PRP) Intratesticular Local Injection in Infertile Men with Asthenospermia: A Prospective Case Control Study

Intratesticular Local Injection in Infertile Men with Asthenospermia

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ABSTRACT

Objective: To assess and evaluate the effectiveness of intratesticular local injection of platelet rich plasma in patient with history of infertility had asthenospermia diagnosed by seminal fluid analysis.

Study Design: Prospective study

Place and Duration of Study: This study was conducted at the Infertility Clinic, Urology Department, Aldiwaniyah Teaching Hospital Iraq from 15th March 2024 to 31st December 2025.

Methods: Two hundred patients with history of infertility their age 25-40 years had asthenospermia confirmed by seminal fluid analysis at where enrolled. Seminal fluid analysis and hormonal evaluation were done in all patients before platelet rich plasma injection and at one, three and six months post injection, the local intratesticular platelet rich plasma were done under sterile condition in all patients. There are two types of outcomes were observed, the primary outcome was sperm motility improvement and the secondary outcomes were the changes that observed in sperm count and morphology and the safety profile of the procedures.

Results: Sperm motility show a significant improvement following platelet rich plasma injection progressive motility increased from 16.3%±4.1 at baseline to 38.9%±4.5 at 6 months (p<0.001), while total motility improved from 27.5%±7.2 to 48.7%±8.1 (p<0.001). Sperm count increased from 19.5±7.3 to 30.2±6.4 million/ml, and normal morphology improved from 4.6%±1.3 to 6.8%±1.9 (p<0.001). Generally, 80% of participates showed significant improvement. The process was safe, and mild temporary complications like scrotal pain 15%, swelling 7.5% and hematoma 2.5%.

Conclusion: Intratesticular platelet rich plasma injection, can be consider as a safe and promising minimally invasive therapy for improving sperm motility and overall semen parameters in men with asthenospermia.

Key Words: Asthenospermia, Platelet rich plasma, Male infertility, Intratesticular injection

Citation of article: Obaid AA, Alwan AAA, AlHamzawi SA. Evaluation of the Effectiveness and Outcome of Platelet Rich Plasma (PRP) Intratesticular Local Injection in Infertile Men with Asthenospermia: A Prospective Case Control Study. Med Forum 2026;37(6):137-140. doi:10.60110/medforum.370626.

INTRODUCTION

Approximately 40–50% of cases of male infertility are due to male factor which include abnormality in sperm parameters which include (count, morphology and motility) which is inability of sperm to fertilized ova. oxidative stress, mitochondrial dysfunction, hormonal imbalance, and structural abnormalities of the sperm flagellum can lead to low sperm motility that may occur alone or as part of OAT syndrome.¹

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Received: January, 2026

Reviewed: February-March, 2026

Accepted: April, 2026

There are many methods of medical treatment for male infertility which include modification in lifestyle, antioxidant measures, hormonal treatments, and assisted reproductive technologies (ART) such as intracytoplasmic sperm injection (ICSI). These techniques mainly bypass the underlying pathology rather than recovering normal spermatogenesis or function of sperm. Consequently, gold therapeutic strategies designed at improve spermatogenesis and improving quality of sperm directly at the level of testicular has attracted increasing scientific interest.²

Platelet rich plasma is intratesticular injection therapy, which include the direct injection of platelet rich plasma into the testicular tissue for stimulation of spermatogenesis and promote semen parameters. PRP injection has a direct action on germ cell, seminiferous tubules and Sertoli cells and leading to local microenvironment that's is necessary for production and maturation of the sperm. Previous studies have showing that PRP intratesticular injection led to modification in the function of Sertoli cell, supporting

the role of this technique of the treatment of male reproductive disorder.³

Because of high concentration of cytokines, growth factor and regenerative substances that found in the platelet-rich plasma (PRP), it considers as is one of the most important widely studied biological therapeutic approaches. Vascular endothelial growth factor (VEGF), transforming growth factor- β (TGF- β), platelet-derived growth factor (PDGF) had a major role in reducing decreasing oxidative stress, and enhancing healing of tissue, and promoting the spermatogenesis process within the testes.⁴

Direct injection of PRP into the testis had been demonstrated by initial clinical studies to improve spermatogenesis and positively affected the hormonal balance in men with compromised testicular function, these finding demonstrate the potential role of this type of therapy as an important therapeutic method for the disorder associated with impairment of process of spermatogenesis. However, further randomized control studies are needed to show the true clinical value of this type of treatment. Nevertheless, intratesticular injection has recently attracted growing interest as a potential method for restoring testicular function and enhancing sperm motility in men affected by asthenospermia.⁵

METHODS

This prospective study was carried out at Infertility Clinic, Urology Department, Aldiwaniyah Teaching Hospital Iraq from 15th March 2024 to March 31st December 2025 vide letter No. .MF/B-26 Dated March 7, 2024. Two hundred infertile patients with asthenospermia identified by seminal fluid analysis were enrolled. All patients age 1.25-40 years old, one year history of infertility, two seminal fluid analysis revealed asthenospermia at 2-7 days interval and signed written informed consent were included. Those patients with azoospermia or severe oligospermia, obstructive causes of infertility, varicocele needs surgical correction, pyospermia on SFA, past history of testicular tumor, undescended testicle or previous testicular surgery and chronic Endocrine disease that affects fertility, like diabetes mellitus, thyroid disorder, or hypogonadism were excluded.

The patients were evaluated and assessed by Thurow history taking, physical examination, laboratory evaluation which include SFA after 3-5 days of abstinence and at least two sample of seminal fluid collected before intervention and assessed for volume of ejaculate, count, morphology, vitality and motility including progressive and total motility. Also, FSH, LH, testosterone and prolactin level were checked in all patients. Radiological evaluation in form of scrotal ultrasound was performed in all patients to exclude varicocele or testicular abnormalities. After the evaluation and under strict sterile environment all patients received PRP intratesticular injections by placing the patients in supine position ,preparation and sterilization of the scrotal skin by bovidine iodine

antiseptic solution and applying local anesthesia before PRP injuction by using a fine needle sterile syringe directly and carefully into the both testes and all patients were kept under observations for short time to identify any complications that might be occurred postoperatively. After PRP intratesticular injection of both testes all patients arranged for follow up to assessed the amount of improvement in sperm motility and detection of any complications related to the procedure and the assessment including clinical assessment for edema, infection or another adverting events and also seminal fluid analysis that performed one, three, and six months postoperatively by comparing the seminal fluid parameters pre and post treatment.

There are two types of outcomes, the primary outcome and the secondary outcome, the primary outcome of the study is to assess the improvement in the sperm motility in seminal fluid analysis after PRP intratesticular injection. The secondary outcome was observation the changes that occurred in sperm count and morphology and volume of ejaculate and hormonal changes after treatment and the complications related to the procedure. The data was entered and analyzed through SPSS-25. The paired t-test was used. A $p < 0.05$ was considered statistically significant.

RESULTS

The mean age of the patients was 32.9 ± 6.74 years, and the range of age was 25-40 years. The average period of infertility was 2.8 ± 1.5 years. Those patients with history of primary infertility were 140 (70%) while those with history of secondary infertility were 60 (30%). 40% of the participants in this study were smokers and the other 60% of the participants were non-smokers (Table 1). Low sperm motility asthenospermia in seminal fluid analysis before intratesticular injuction of PRP. The mean semen volume was 2.6 ± 0.6 ml. The mean sperm count was 19.5 ± 7.3 million/ml. The progressively motile sperm mean was $16.3 \pm 4.1\%$, while the mean of total motility was $27.5 \pm 7.2\%$. The mean percentage of normal morphology shaped was $4.6 \pm 1.3\%$ (Table 2).

Changes post PRP injection, sperm motility revealed a marked improvement post PRP intratesticular injection. Regarding the progressive motility the mean was increased from $16.3 \pm 4.1\%$ at baseline to $28.8 \pm 6.9\%$ after one month, $33.8 \pm 7.1\%$ after three months, and $38.9 \pm 4.5\%$ after six months, this increase in progressive motility was a statistically significant in comparison to the baseline initial levels ($p < 0.001$). The mean of total sperm motility also increased from the initial baseline level before treatment that was $27.5 \pm 7.2\%$ to $35.2 \pm 5.8\%$ at one month, $42.9 \pm 6.1\%$ at three months, and $48.7 \pm 8.1\%$ at six months, this rising in values was also statistically significant ($p < 0.001$). Also, the other semen parameters revealed gradual improvement through the period of follow up. The mean sperm count

increase from 19.5±7.3 million/ml before injunction to 24.8±5.6 million/ml after one month, 27.1±8.1 million/ml after three months, and 30.2±6.4 million/ml after six months, which was statistically significantly increase (p<0.001). Moreover, the mean percentage of morphology of spermatozoa in the seminal fluid analysis was also enhance and became better through the follow up period of study increasing from 4.6±1.3% prior to PRP injunction reaching to 5.3±22% at one month, 6.1±21% at three months, and 6.8±19% at six months, this rising in values was also statistically significant (p<0.001) [Table 3].

A significant percentage of studied participants (80%, n=160) showed a significant increase in progressive sperm motility, nevertheless 40 (20%, n=40) showed little or no improvement following treatment. PRP intratesticular injunction show excellent safety and well tolerated by all patients. Very mild transient scrotal pain and mild scrotal swelling had been recorded occurred in 30 15% and 7.5% respectively. Very mild and small scrotal hematoma occurred in 5 (2.5%). No other severe complications like infection or atrophy of the testis had been recorded (Table 4). Intratesticular injection significantly improved sperm motility in men diagnosed with asthenospermia. Both progressive and total motility increased gradually during follow-up,

with the greatest improvement recorded at six months post-treatment. Significant improvements were also noted in sperm concentration and morphology. Overall, the treatment was safe and associated mainly with mild, temporary complications.

Table No. 1: Demographic and clinical characteristic of patients (n=200)

| Variable | Value |
|------------------------------|-----------|
| Age (years) | 32.9±6.74 |
| Infertility duration (years) | 2.8±1.5 |
| Primary infertility | 140(70%) |
| Secondary infertility | 60 (30%) |
| Smokers | 80 (40%) |
| Non-smokers | 120 (60%) |

Table No. 2: Seminal fluid analysis baseline characteristic

| Variable | Value |
|--------------------------------|----------|
| Semen volume (ml) | 2.6±0.6 |
| Sperm count (million/ml) | 19.5±7.3 |
| Progressively motile sperm (%) | 16.3±4.1 |
| Total motility (%) | 27.5±7.2 |
| Normal morphology shaped (%) | 4.6±1.3 |

Table No. 3: Semen changes post PRP injection

| Variable | Changes post PRP injection | | | P value |
|--------------------------|----------------------------|----------|----------|---------|
| | 1 month | 3 months | 6 months | |
| Progressive motility (%) | 28.8±6.9 | 33.8±7.1 | 38.9±4.5 | < 0.001 |
| Total sperm motility (%) | 35.2±5.8 | 42.9±6.1 | 48.7±8.1 | < 0.001 |
| Sperm count (million/ml) | 24.8±5.6 | 27.1±8.1 | 30.2±6.4 | < 0.001 |
| Morphology (%) | 5.3±22 | 6.1±21 | 6.8±19 | < 0.001 |

Table No. 4: Complications following intratesticular injection

| Complication | % |
|--------------------|------|
| Scrotal pain | 15.0 |
| Scrotal swelling | 7.5 |
| Scrotal hematoma | 2.5 |
| Infection | - |
| Testicular atrophy | - |

DISCUSSION

Male infertility considered as a general global health problem accounting about 40-50% of infertility cases among couples worldwide and this mostly related to genetic, environmental and social factors like smoking and obesity and this necessary to raising the awareness and early diagnosis of this problem and provide several therapeutic measures with low cost to overcome this big social problem.^{6,7}

The spermatogenesis is a complex physiological process that required approximately 64-74 days within the seminiferous tubules and many divisions and differentiation stages to produce a mature spermatozoon

capable for motility and fertilization and can affected by the therapeutic measures at this period.⁸

Local intratesticular injunction of PRP had been stimulate the testicular tissues to produce spermatozoa and increasing the levels of testosterone through direct and close interactions with Sertoli cells, Leydig cells and germinal epithelial layers with minimal adverse systemic effects.^{9,10}

The oxidative stress is one of the main reasons of male infertility and this result from the imbalance between the free radicals and reactive oxygen species and this imbalance led to damage of the wall of the spermatozoa and fragmentation of DNA and decreasing of the count and motility which lead to the inability of spermatozoa to fertilized the ova.¹¹

In this study, the direct intratesticular local injection of PRP not restricted only to improve sperm motility but also it led to a noticeable improvement in the sperm count and morphology through the period of follow up and this give a great opportunity for treatment of male infertility cases.

Intratesticular injunction of PRP can be considered as a promising technology in regeneration of the testicular tissues because it contains several biological growth

factors like Platelet derived growth factor (PDGF), transforming growth factor B (TGFB) and vascular endothelial growth factor (VEGF), these factors leading to enhancement of testicular tissues repair and improving local testicular blood flow and promoting spermatogenesis.^{12,13}

The results of this study refer to there is a great improvement in seminal fluid analysis parameters after PRP intratesticular injection and this results clearly consistent with many of previous clinical and investigational studies for evaluation of regenerative therapeutic approaches in treatment of male infertility.^{14,15}

In this study, platelet rich plasma intratesticular injection is a highly safe procedure with little complications in form of mild scrotal pain, mild scrotal swelling and mild local scrotal hematoma these complications were transient well tolerated by all patients and managed conservatively and resolved within short period of time, these results consisting with most of the earlier reports that demonstrate that PRP local intratesticular injection was a safe procedure if done under sterile environment. There were encouraging but still there were many limitations for this study, first of them is the absence of the control group to make a clear and definitive conclusions for assessment and evaluation of the effectiveness this technique in management of male infertility, the other limitation was the short period of follow-up that restrict the evaluation of long term outcomes of reproduction like pregnancy, still birth and miscarriage rates.

CONCLUSION

Platelet rich plasma intratesticular injection therapy may lead to significant improvement in seminal fluid analysis parameters including asthenospermia and it can be considered as a safe and promising minimally invasive technique for management of male infertility cases.

Author’s Contribution:

| | |
|--|--|
| Concept & Design or acquisition of analysis or interpretation of data: | Ahmed Ali Obaid, Ahmed Abdul Ameer Alwan |
| Drafting or Revising Critically: | Ahmed Ali Obaid, Shiren Ali AlHamzawi |
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Conflict of Interest: The study has no conflict of interest to declare by any author.

Source of Funding: None

Ethical Approval: No.MF/B-26 Dated 07.03.2024

REFERENCES

1. American Urological Association (AUA) & American Society for Reproductive Medicine

(ASRM). Diagnosis and treatment of infertility in men. Guideline 2024; 45.

2. Ortega C, Verheyen G, Raick D, Camus M, Devroey P. Asthenozoospermia and its implications for male infertility. *Human Reprod Update* 2025; 43.

3. Pang KH. The role and implication of platelet-rich plasma in male factor infertility: a systematic review of human studies. *Androl* 2026;14(1):284-93.

4. Karaosmanoglu O, Korun ZEU, Tufek I, Kural AR, Tiras B. The effect of intratesticular autologous platelet-rich plasma injection on sperm retrieval rates and in vitro fertilization outcomes in couples with non-obstructive azoospermia. *J Obstet Gynaecol Res* 2024;50(10):1977-84.

5. Farhan R.H. In vivo effects of PRP intratesticular injection on spermatogenesis and reproductive hormonal levels. *Neuroquantol* 2022;43.

6. Agarwal A, Mulgund A, Hamada A, Chyatte MR. A unique view on male infertility around the globe. *Reprod Biol Endocrinol* 2015;13:37.

7. Cáceres C, Konda K, Pecheny M, Chatterjee A, Lyerla R. Estimating the number of men who have sex with men in low and middle income countries. *Sex Transm Infect* 2006;82 Suppl3(Suppl 3):iii3-9

8. Aitken RJ, Baker MA. Oxidative stress, sperm survival and fertility control. *Molecular Cellular Endocrinol* 2006;250:66-9.

9. Amann RP. The cycle of the seminiferous epithelium in humans: a need to revisit? *J Androl* 2008;29(5):469-87.

10. Heninger NL, Staub C, Blanchard TL, Johnson L, Varner DD, Forrest DW. Germ cell apoptosis in the testes of normal stallions. *Theriogenol* 2004;62(1-2):283-97.

11. Gerendai I. Intratesticular drug administration and its effects on testicular function. *Endocrine* 2004; 23(1):31-6.

12. Alonso-Frías P, Esbert M. Therapeutic use of platelet-rich plasma for the treatment of male infertility. *Rev Int Androl* 2024;22(3):16-23.

13. Yan B, Zhang Y, Tian S, Hu R, Wu B. Effect of autologous platelet-rich plasma on human sperm quality during cryopreservation. *Cryobiol* 2021;98:12-6.

14. Gudelci T, Cakiroglu Y, Yuceturk A, Batir S, Karaosmanoglu O, Korun ZEU, et al. The effect of intratesticular autologous platelet-rich plasma injection on sperm retrieval rates and in vitro fertilization outcomes in couples with non-obstructive azoospermia. *J Obstet Gynaecol Res* 2024;50(10):1977-84.

15. Aboukhshaba A, Punjani N, Doukakis S, Zaninovic N, Palermo G, Schlegel PN. Testicular sperm characteristics in men with nonobstructive azoospermia and their impact on intracytoplasmic sperm injection outcome. *Fertil Steril* 2022;117(3):522-7.