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The Effect of Platelet-Rich Plasma Injection as Therapy for Stress Urinary Incontinence Cases

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ABSTRACT

Women frequently have stress urinary incontinence (SUI), which has a major negative influence on their quality of life. A non-surgical method of enhancing SUI that shows potential is platelet-rich plasma (PRP) therapy, by improving urethral tissue strength and enhancing the urethral closure mechanism. The usefulness of PRP in increasing urethral resistance and lowering SUI symptoms has been examined in recent literature studies conducted between 2019 and 2023. Although the first results are encouraging, more investigation is required to validate long-term advantages and clinical efficacy in broader groups, as well as to comprehend possible adverse effects and related difficulties. For SUI patients looking for non-surgical options, PRP offers an alluring treatment option with the potential to lessen the need for invasive surgical procedures. However, further development and broader clinical studies are necessary to strengthen these findings and support the clinical use of PRP in the management of SUI to improve quality of life.

Keywords: Pad Test, Platelet-Rich Plasma, QUID Questionnaire, stress urinary incontinence

Stress Urinary Incontinence (SUI) is among the most prevalent forms of urinary incontinence, characterized by unintentional urine leakage due to increased intra-abdominal pressure that the urethral closure mechanism cannot be overcome.[1] The International Continence Society (ICS) defines SUI as the involuntary loss of urine during activities that increase abdominal pressure, such as coughing, sneezing, or lifting heavy objects.[2] This condition significantly impacts the physiological, psychological, and financial aspects of the affected individual, notably decreasing their quality of life.[3]

Globally, the prevalence of SUI varies depending on the population and survey methods, ranging from 10% to 70%.[4] In the United States, SUI affects 46% of adult women, while the prevalence among men, particularly those with prostate or bladder issues, is 31%.[5] In Asia, a study in China revealed that 18.9% of women over 20 years old experience SUI, with the highest prevalence occurring in the perimenopausal group. In Indonesia, research by Fakhrizal et al. (2016) found that 8.8% of primiparous women experience persistent SUI after childbirth, with major risk factors including vaginal delivery and high birth weight. The study also highlighted that persistent SUI up to three months postpartum can result from hormonal changes and alterations to the pelvic floor muscles during pregnancy. Early detection and appropriate management of SUI in postpartum women are critical.[6]

Milsom *et al.* (2001) identified key risk factors for SUI, including age, postmenopausal status, multiple pregnancies, obesity, pelvic floor muscle weakness, and conditions that increase intra-abdominal pressure, such as chronic cough or constipation.[7]

Although SUI is not life-threatening, its impact on an individual's well-being is significant. People with SUI are more likely to experience psychological disorders like depression and anxiety, which result from reduced self-esteem and limited social participation .[8] Additionally, the risk of falls and fractures increases in older individuals with SUI due to the urgency of urination, leading to hasty movements.[9] On an economic level, SUI places a heavy burden on the healthcare system, with

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estimated treatment costs exceeding $12 billion annually in the United States.[10]

Treatment options for SUI range from conservative methods such as pelvic floor muscle training and urethral support devices to pharmacological treatments and surgical interventions.[11] Among surgical treatments, the use of Transobturator Tape (TOT) or Mid-Urethral Sling (MUS) procedures is common, boasting a high success rate. However, approximately 4.4% of patients may require reoperation due to recurrence or postoperative complications such as bladder perforation and bowel injury.[12] This recurrence rate suggests the need for further exploration into adjunct therapies that could improve urethral tissue healing and decrease the risk of procedural failure.[13]

Platelet-Rich Plasma (PRP) injections have gained significant interest in the field of regenerative medicine, as they contain several growth factors, including platelet-derived growth factor (PDGF), vascular endothelial growth factor (VEGF), transforming growth factor-beta (TGF-β), and fibroblast growth factor (FGF) (Marx 2004). PRP has the potential to enhance angiogenesis, promote tissue regeneration, and accelerate the remodeling of urethral tissue, making it a promising alternative for managing SUI.[14] Early studies suggest that PRP may improve urethral tissue strength and enhance the urethral closure mechanism, though clinical data supporting its efficacy remains limited and warrants further investigation.[15]

This literature review seeks to assess the effectiveness of PRP injection therapy for SUI, focusing on its ability to improve urethral resistance and reduce the recurrence rate after surgery. By analyzing existing clinical evidence, this study aims to offer insights into the potential of PRP as a regenerative treatment for SUI and provide a foundation for further research in urogynecology and pelvic floor reconstruction.[16]

METHOD

This study is a descriptive research utilizing a literature review method, where the data sources are derived from quantitative research journals employing a cross-sectional approach. The analyzed data consists of secondary data in the form of research articles obtained from online journals through searches in databases such as Google Scholar, PubMed, and ResearchGate. The selected journals were published between 2019 and 2023.

The search focused on medical and health journals, both domestic and international, that discussed research related to stress urinary incontinence and platelet-rich plasma published within this period. After the selection process, the researcher compiled the research data by categorizing information on authors, titles, year of publication, research methods (including design and sample size), and research findings. All collected data were then reviewed and analyzed by the researcher.

RESULTS

Based on a review of five journal articles that met the established criteria, the results can be seen in Table 1.

DISCUSSION

The management of Stress Urinary Incontinence (SUI) remains an unresolved challenge and is one of the common issues that significantly impact women's health and quality of life. Autologous Platelet-Rich Plasma (PRP) injections have gained recognition as a potential approach to accelerating tissue healing and regeneration in the treatment of SUI. Common symptoms include urine leakage during coughing or sneezing, difficulty holding urine during certain physical activities, and an increased urgency to urinate. It is important to note that this condition may be associated with chronic inflammation. Therefore, the management of SUI aims not only to alleviate daily symptoms but also to reduce the risk of more serious long-term complications.[22,23]

Table 1. Article review results

Researcher	Title	Year	Method	Results
Fariba Behnia-Willison, Tran T.T. Nguyen, Aidan J. Norbury, Behrang Mohamadi, Stefano Salvatore, Alan Lam[17]	Promising Impact of Platelet Rich Plasma and Carbon Dioxide Laser for Stress Urinary Incontinence	2020	62 patients with SUI underwent three sessions of transvaginal CO2 laser and PRP treatment, evaluated with the bladder function section of the Australian Pelvic Floor Questionnaire (APFQ).	Of 62 patients with SUI, 66% reported improvement in SUI symptoms, and bladder function variables all improved significantly. The combination of transvaginal CO2 laser with PRP may be a beneficial treatment for SUI, as a minimally invasive alternative with low risk and short recovery time.
Ching-Hsiang Chiang, Hann-Chorng Kuo[18]	The Efficacy and Mid-term Durability of Urethral Sphincter Injections of Platelet-Rich Plasma in Treatment of Female Stress Urinary Incontinence	2022	Prospective study in 26 patients with SUI	PRP treatment improved SUI in 80.8% of women, with 26.9% declared cured at follow-up.
Ahmed Samy Tahoon, Hossam El-Din Hussein Salem, Assem Anwar Abdo Mousa[19]	The Role of Platelet-Rich Plasma Injections in Cases of Stress Incontinence	2022	A 1-year prospective intervention study of 20 patients with SUI. Evaluation using various parameters before and after PRP injection	This study showed that PRP was effective in treating women with SUI for three months post-treatment, with significant results on bladder function.
Irina Dankova, Nikolaos Pyrgidis, Maksim Tishukov, Efstratia Georgiadou, Meletios P. Nigdelis, Erich-Franz Solomayer, Julian Marcon, Christian G. Stief, Dimitrios Hatzichristou[20]	Efficacy and Safety of Platelet-Rich Plasma Injections for the Treatment of Female Sexual Dysfunction and Stress Urinary Incontinence: A Systematic Review	2023	Studies were conducted through a systematic search in PubMed, Embase, and Cochrane Library. Clinical studies evaluating PRP in gynecological disorders.	PRP significantly improved the female sexual function index (FSFI), vaginal health index (VHI), and female sexual distress score (FSDS) for FSD. For SUI, PRP significantly improved the ICIQ-SF and UDI-6 scores.
Apisith Saraluck, Orawee Chinthakanan, Athasit Kijmanawat, Komkrit Aimjirakul, Rujira Wattanayingcharoenchai, Jittima Manonai[21]	Autologous platelet-rich plasma (A-PRP) combined with pelvic floor muscle training for the treatment of female stress urinary incontinence (SUI): A randomized controlled clinical trial	2024	Randomized clinical trial, single-blind assessment on 64 patients divided into 2 groups, namely the PRP + PFMT group and the PFMT only group	In this study, it was shown that 90% of patients in the PRP + PFMT group experienced an improvement of at least 50% in SUI, while only 14% of patients in the PFMT alone group achieved a similar level of improvement.

This study reveals that PRP injection around the urethra is a safe and effective method for enhancing urethral resistance and improving SUI, making it a promising alternative therapy for women with SUI. Additionally, PRP, as a biological reagent, possesses strong anti-inflammatory properties and healing effects, supported by its high concentration of growth factors. These properties play a crucial role in protecting cells, repairing, and regenerating epithelial tissue, demonstrating PRP's effectiveness in strengthening urethral resistance. Furthermore, PRP has been proven to mitigate severe inflammation and protect patients from long-term effects such as chronic inflammation.[24,25]

In conclusion, autologous PRP therapy shows promise as an effective treatment strategy for SUI, demonstrating encouraging results in tissue healing and regeneration. However, further clinical studies on this technique are necessary to confirm the efficacy and long-term outcomes of PRP for SUI in a larger study population. The advancement of PRP in SUI treatment offers hope for improving genital health, hygiene, immunity, and overall patient quality of life.

CONCLUSION

Based on the analysis of a literature review from five journals obtained through searches in the Google Scholar, PubMed, and ResearchGate databases, as well as a rigorous study selection process, it was concluded that all reviewed journals demonstrated significant results supporting the effectiveness of PRP injection therapy in the recovery of patients with Stress Urinary Incontinence (SUI). These findings indicate that PRP has the potential to be a promising therapeutic option for improving the quality of life of patients with SUI.

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