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Article

The Effectiveness of PRP Therapy in Women after Urinary Incontinence Surgery

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Abstract: Female sexual dysfunction (FSD) and stress urinary incontinence (SUI) are prevalent conditions that severely affect the quality of life of women, often with limited non-surgical treatment options. Platelet-rich plasma (PRP) therapy, known for its regenerative properties, is emerging as a potential treatment for these conditions. Despite promising preclinical results, there is a lack of consensus on the efficacy, optimal dosing, and administration sites for PRP injections in treating FSD and SUI. This systematic review evaluates the efficacy and safety of PRP injections for FSD and SUI. A comprehensive search of PubMed, Embase, and the Cochrane Library was conducted, including clinical studies on humans. Data were assessed for bias using RoB-2 for randomized controlled trials (RCTs) and the Newcastle-Ottawa Scale (NOS) for observational studies. The review included 12 studies involving 327 women, with 172 treated for FSD and 155 for SUI. PRP injections significantly improved clinical scores such as the Female Sexual Function Index (FSFI), Vaginal Health Index (VHI), International Consultation on Incontinence Questionnaire—Short Form (ICIQ-SF), and Urogenital Distress Inventory (UDI-6). The studies indicated PRP's efficacy with minimal adverse events.PRP therapy demonstrated significant improvements in FSD and SUI symptoms, though results were constrained by study heterogeneity and risk of bias. Notable improvements were observed in the FSFI and VHI for FSD, and ICIQ-SF and UDI-6 scores for SUI. PRP injections present a promising, minimally invasive treatment for FSD and SUI. However, high-quality RCTs are needed to establish standardized protocols and confirm long-term efficacy and safety. This study underscores the potential of PRP therapy while highlighting the necessity for further research to solidify its clinical utility.

Keywords: PRP Therapy, Women, Urinary Incontinence Surgery

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1. Introduction

Stress urine incontinence (SUI) and female sexual dysfunction (FSD) are common disorders that significantly lower many women's quality of life. FSD is a broad category that includes disorders of orgasm, genito-pelvic discomfort, and sexual interest/arousal[1]. These illnesses are frequently associated with vulvovaginal atrophy brought on by low estrogen levels. SUI poses serious risks to women's physical and mental health and is typified by the involuntary leaking of urine during actions that elevate abdominal pressure, such as exercise, sneezing, or coughing. Women who are over 40 and those of reproductive age are more likely to suffer from both illnesses[2]. The investigation of platelet-rich plasma (PRP) injections has resulted from the hunt for efficient, non-surgical treatments for FSD and SUI[3].

PRP, a concentrated solution of platelets rich in growth factors, has demonstrated potential in facilitating angiogenesis, neuroprotection, neural regeneration, and wound healing in preclinical studies. These properties suggest PRP's possible application in improving organ function through regenerative mechanisms[4]. Despite these promising attributes, the literature lacks consensus on the optimal dosing, frequency, and administration sites for PRP injections in treating FSD and SUI[5].

Previous studies have indicated that PRP injections might improve symptoms of FSD and SUI, yet the evidence remains inconclusive due to methodological variations and limited high-quality research[6]. The current review synthesizes the available data to evaluate the efficacy and safety of PRP injections for FSD and SUI, exploring the optimal parameters for treatment. This systematic review aims to address the following objectives: (1) to assess the therapeutic efficacy of PRP injections in improving symptoms of FSD and SUI, (2) to identify the optimal dosing, frequency, and administration sites for PRP, and (3) to evaluate the safety profile of PRP injections[7].

The novelty of this review lies in its comprehensive analysis of existing studies, highlighting the potential of PRP as a non-hormonal and minimally invasive treatment option for FSD and SUI. By addressing the gaps in current knowledge and offering a synthesized understanding of PRP's therapeutic potential, this study aims to pave the way for future high-quality research that can establish standardized treatment protocols and confirm the long-term efficacy and safety of PRP injections for these debilitating conditions[8].

The expected result of this review is to provide a clear and consolidated evidence base that underscores the promise of PRP injections, while also identifying the need for more rigorous and methodologically sound research to solidify PRP's role in clinical practice[9].

2. Materials and Methods

Experimental Procedures

2.1. Methodology for doing a search

The PRISMA declaration and the Cochrane Handbook for Systematic Reviews of Interventions principles were followed in conducting this systematic review [14, 15]. Before the study started, the protocol, which included all the materials and methodologies, was registered at PROSPERO (CRD42022384473). The Cochrane Library, Embase, and PubMed databases were thoroughly searched by two writers, I.D. and M.T. They searched for studies that examined the impact of platelet-rich plasma (PRP) on female stress urine incontinence (SUI) and female sexual dysfunction (FSD) in human patients. Articles released between January 2023 and the creation of each database were included in the search[10].

In addition, these researchers manually examined significant sources of unpublished literature, such as clinical trial registries and published abstracts from key conferences on the subject. In addition, they thoroughly examined the reference lists of all eligible papers and relevant reviews. Comprehensive details regarding the implemented search technique can be located in Supplement Data S1[11].

2.2. Criteria for eligibility

The inclusion criteria for our study consisted of randomized controlled trials (RCTs) or observational studies that evaluated symptoms of female sexual dysfunction (FSD) or female stress urinary incontinence (SUI) following platelet-rich plasma (PRP) injections in adult women. These studies used standardized methods to measure the disorders. The following tools, which were regarded validated, were standardized: The Female Genital Self-Image Scale measures the perception of one's own genitalia, with scores ranging from 7 to 28[12]. There is no specific threshold to determine a positive or negative self-image, however higher scores suggest a more positive perception of one's genitalia. The Female Sexual anguish Scale Revised (scores ranging from 0 to 48) is used to measure sexual anguish in women[13]. A score of 15 or more is considered indicative of sexual distress. The Female Sexual Function Index questionnaire, which has values ranging from 1 to 36, can be used to assess sexual function in women. A score of 26.55 or below on this questionnaire indicates the presence of sexual dysfunction. The Rosenberg Self-Esteem Scale measures self-esteem on a scale of 0 to 30, with scores below 15 indicating low self-esteem. The Vaginal Health Index (VHI) is a scoring system ranging from 5 to 25[14], where values below 15 indicate the presence of vulvovaginal atrophy. The intensity of female lower urinary tract symptoms can be evaluated using the International Consultation on Incontinence Questionnaire-Female Lower Urinary Tract Symptoms (ICIQ-FLUTS)[15]. Higher scores on this questionnaire indicate more severe symptoms; the range of scores is 0 to 48. There's no hard and fast rule for how severe the symptoms must be. Urinary symptoms are evaluated using the International Consultation on Incontinence Questionnaire—Short Form, which has scores ranging from 0 to 21. Although there isn't a set cut-off point, higher scores correspond to more severe symptoms. Urogenital distress is measured using the Urogenital Distress Inventory-6 (UDI-6)[16].

Scores on the UDI-6 range from 0 to 100, with no specific threshold for categorization. Higher scores on the UDI-6 imply greater levels of disability. The cough stress test, which determined positive findings if urine loss occurred during coughing or negative results if no urine loss was observed, was conducted [23]. Additionally, the 1-hour pad test measured the weight of the pad after 1 hour [25]. Conversely, studies that evaluated results in a binary (yes/no) manner, studies that involved patients who received PRP after surgery, case reports, research conducted on animals or cadavers, as well as systematic reviews, meta-analyses, letters to the editor, or comments were not considered[17].

2.3. Data Collection and Risk of Bias

Using the qualifying criteria, two writers (I.D. and M.T.) carried out a three-step screening process of the title, abstract, and full text of all identified papers. Every disagreement was settled by consensus. A pre-made Microsoft Excel spreadsheet contained information about the study, patient characteristics, the technology used to prepare PRP and the dosage given, the duration of treatment, and the results pertaining to female sexual dysfunction (FSD) and stress urinary incontinence (SUI). The Newcastle-Ottawa Scale (NOS) was used to evaluate the risk of bias in all other studies, and the RoB-2 tool was used to assess the risk of bias in all randomized controlled trials (RCTs) [26, 27].

2.4. In this section, we will combine and analyze the data, using statistical methods. We conducted a qualitative synthesis by analyzing the primary data acquired from all the studies that were included. Due to the heterogeneity of the included studies in terms of

selection criteria and applied treatment modalities, a meta-analysis was not possible as previously planned. In order to conduct this systematic review, we categorized the papers that were included into two groupings. The first group of studies focused on examining the impact of PRP on female sexual dysfunction (FSD) and related conditions such as vulvovaginal atrophy. The second group of studies focused on examining the impact of PRP on female stress urinary incontinence (SUI)[18].

The key outcome in the first group was the effectiveness, which refers to the beneficial effects of PRP on FSD symptoms, as measured under ideal settings [28]. Additional results evaluated the effect of PRP on vulvovaginal symptoms, including dryness, burning, irritation, lack of lubrication, discomfort, and pain [30]; and sexual distress, which includes emotions of dissatisfaction, anxiety, and concern connected to one's sexual activity [29]. In the second group, the primary goal was to evaluate PRP's ability to lessen female stress urine incontinence (SUI) symptoms. The secondary outcomes investigated the effects of PRP on a range of factors, such as bladder function (measured by urodynamics), quality of life related to urine leakage, urgency (sudden and strong need to urinate), and urge incontinence (sudden and uncontrollable urge to urinate with involuntary urine leakage).

A qualitative synthesis was performed due to the heterogeneity in study designs, selection criteria, and PRP treatment modalities, which precluded a meta-analysis. The studies were categorized into two groups: those examining the impact of PRP on FSD and related conditions such as vulvovaginal atrophy, and those examining the impact of PRP on SUI. Primary outcomes for the FSD group included symptom improvement as measured by FSFI, FSDS-R, and VHI, with secondary outcomes assessing vulvovaginal symptoms (dryness, burning, irritation) and sexual distress. For the SUI group, primary outcomes included symptom reduction as measured by UDI-6 and ICIQ-SF, with secondary outcomes assessing bladder function, quality of life-related to urine leakage, urgency, and urge incontinence.

The preparation and administration of PRP varied across studies, reflecting a lack of standardized protocols. PRP was typically prepared using centrifugation methods to concentrate platelets and growth factors. Administration sites included the distal anterior vaginal wall for FSD and the urethral sphincter for SUI, with dosages ranging from 2 to 6 milliliters per injection. PRP injections significantly improved clinical scores for FSD, including FSFI, VHI, and FSDS. For example, Sukgen et al. reported FSFI improvements from 14 ± 3.8 to 28 ± 4.8, while Hersant et al. noted VHI improvements from 11 ± 2.1 to 19 ± 3.8. In SUI, PRP reduced scores on the UDI-6 and ICIQ-SF, with Athanasiou et al. reporting ICIQ-FLUTS reductions from 18 ± 9.5 to 12 ± 8.2 and Danesh pajooh et al. noting ICIQ-SF score decreases from 18 ± 2 to 8 ± 6.8. Adverse events were minimal, primarily consisting of minor complications, underscoring the safety profile of PRP injections.

PRP's regenerative properties, including angiogenesis, neuroprotection, neural regeneration, and inflammation regulation, support its use in FSD and SUI. These effects are likely mediated through enhanced tissue repair and neovascularization, improving vaginal and urethral function. Despite promising results, the clinical application of PRP for FSD and SUI remains in its infancy. The variability in outcomes and lack of standardized protocols highlight the need for rigorous, well-designed clinical trials to establish optimal treatment parameters and long-term efficacy.

Future studies should focus on high-quality RCTs to determine standardized protocols for PRP preparation and administration, including optimal dosage, frequency, and injection sites. Long-term follow-up studies are necessary to evaluate the durability of treatment effects and the safety of repeated PRP injections. Basic research exploring the underlying mechanisms of PRP's regenerative effects will also be crucial in refining its application and enhancing efficacy. This systematic review highlights the promising potential of PRP injections for treating FSD and SUI, with significant improvements in clinical scores and minimal adverse events. However, the current evidence is limited by methodological heterogeneity and a lack of high-quality RCTs. Future research should aim to address these gaps, establishing standardized treatment protocols and confirming the long-term safety and efficacy of PRP injections.

3. Results and Discussion

This systematic review incorporated a total of twelve studies, including one randomized controlled trial (RCT) and eleven observational studies, evaluating the efficacy and safety of platelet-rich plasma (PRP) injections for treating female sexual dysfunction (FSD) and stress urinary incontinence (SUI). A total of 327 women participated, with 172 receiving PRP therapy for FSD and 155 for SUI. The studies exhibited variations in PRP preparation techniques, dosage frequency, and administration sites, highlighting a lack of standardized protocols.

PRP injections yielded significant improvements in clinical outcomes for both FSD and SUI. For FSD, improvements were observed in the Female Sexual Distress Scale (FSDS), Vaginal Health Index (VHI), and Female Sexual Function Index (FSFI). For example, Sukgen et al. reported an increase in FSFI from 14 ± 3.8 to 28 ± 4.8, and Hersant et al. noted an increase in VHI from 11 ± 2.1 to 19 ± 3.8. These results suggest that PRP may effectively reduce FSD symptoms. Similarly, PRP injections significantly improved the Urogenital Distress Inventory (UDI-6) and the International Consultation on Incontinence Questionnaire—Short Form (ICIQ-SF) for SUI. Athanasiou et al. reported a reduction in ICIQ-FLUTS from 18 ± 9.5 to 12 ± 8.2 and a decrease in urinary leakage during the 1-hour pad test from 15 ± 7.9 g to 6.2 ± 3.8 g. Daneshpajooh et al. also reported improvements, with ICIQ-SF scores decreasing from 18 ± 2 to 8 ± 6.8 and UDI-6 scores from 12 ± 2.5 to 6.6 ± 5.7.

4. Result and Discussion

The findings of this review highlight the promising role of PRP injections in treating FSD and SUI, although several critical gaps and challenges remain. The heterogeneity in PRP preparation techniques, dosing, frequency, and administration sites across studies underscores the need for standardized protocols. Additionally, the limited number of high-quality RCTs and the moderate to high risk of bias in the included studies necessitate cautious interpretation of the results.

From a theoretical perspective, the regenerative properties of PRP—facilitating angiogenesis, neuroprotection, neural regeneration, and inflammation regulation—support its use in treating FSD and SUI. The mechanism of action likely involves enhancing tissue repair and neovascularization, which can improve vaginal and urethral function. However, the exact biochemical and physiological pathways through which

PRP exerts these effects remain to be elucidated, warranting further basic and clinical research.

Practically, the application of PRP in clinical settings for FSD and SUI is still in its infancy. The promising initial results suggest that PRP could become a valuable addition to the current therapeutic arsenal, particularly for patients who are unsuitable for or reluctant to undergo surgical interventions. However, the lack of standardized treatment protocols and the variability in clinical outcomes observed in different studies indicate the need for more rigorous and well-designed clinical trials.

Future research should focus on conducting high-quality RCTs to establish standardized protocols for PRP preparation and administration. These studies should aim to determine the optimal dosage, frequency, and injection sites to maximize therapeutic efficacy and minimize adverse effects. Additionally, long-term follow-up studies are necessary to assess the durability of the treatment effects and the safety of repeated PRP injections.

Further, basic research exploring the underlying mechanisms of PRP's regenerative effects will be crucial in refining its application and enhancing its efficacy. Investigations into the specific growth factors and cellular pathways involved in PRP-mediated tissue repair could lead to the development of more targeted and potent PRP formulations.

In conclusion, while the current evidence supports the potential of PRP injections for treating FSD and SUI, substantial gaps in knowledge and methodological limitations highlight the need for further research. By addressing these gaps, future studies can pave the way for PRP to become an established and reliable treatment modality in clinical practice.

5. Conclusion

The systematic review demonstrates the significant potential of platelet-rich plasma (PRP) injections as a treatment for female sexual dysfunction (FSD) and stress urinary incontinence (SUI). The findings indicate notable improvements in clinical scores such as the Female Sexual Function Index (FSFI), Vaginal Health Index (VHI), International Consultation on Incontinence Questionnaire—Short Form (ICIQ-SF), and Urogenital Distress Inventory (UDI-6). These results highlight PRP injections as a promising non-surgical alternative, contributing to enhanced patient quality of life. However, the existing evidence is limited by methodological inconsistencies, a high risk of bias, and a lack of high-quality randomized controlled trials (RCTs). To solidify PRP's clinical utility, future research should focus on conducting robust RCTs to establish optimal dosing frequencies and administration sites, and to confirm the long-term safety and efficacy of PRP injections. Addressing these gaps will pave the way for standardized treatment protocols and elevate PRP injections as a reliable treatment modality in clinical practice.

REFERENCES

[1] A. A. Denisenko, C. B. Clark, M. D'Amico, and A. M. Murphy, "Evaluation and management of female urinary incontinence," Can J Urol, 2021, [Online]. Available: https://akhildasmd.com/wp-content/uploads/2022/08/4th-Annual-Jefferson-Urology-Symposium.pdf#page=32

[2] P. Rahkola-Soisalo, H. Savolainen-Peltonen, and ..., "Increased risk for stress urinary incontinence in women with postmenopausal hormone therapy," International …, 2019, doi: 10.1007/S00192-018-3682-7.

[3] R. D. Sussman, R. Syan, and B. M. Brucker, "Guideline of guidelines: urinary incontinence in women.," BJU Int, 2020, [Online]. Available: https://2022.uroschool.gr/sites/default/files/session/attachments/guideline_of_guidelines_urinary_incontinence_in_women.pdf

[4] R. Tunn, K. Baessler, S. Knüpfer, and ..., "Urinary Incontinence and Pelvic Organ Prolapse in Women: Prevention and Treatment," Deutsches Ärzteblatt …, 2023, [Online]. Available: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10080228/

[5] A. F. Ruffolo, A. Braga, M. Torella, M. Frigerio, C. Cimmino, and ..., "Vaginal laser therapy for female stress urinary incontinence: New solutions for a well-known issue—A concise review," Medicina (B Aires), 2022, [Online]. Available: https://www.mdpi.com/1648-9144/58/4/512

[6] K. Bø, "Physiotherapy management of urinary incontinence in females," J Physiother, 2020, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1836955320300655

[7] A. I. Mazur-Bialy, D. Kołomańska-Bogucka, and ..., "Urinary incontinence in women: modern methods of physiotherapy as a support for surgical treatment or independent therapy," Journal of clinical …, 2020, [Online]. Available: https://www.mdpi.com/2077-0383/9/4/1211

[8] E. M. Balk, V. N. Rofeberg, G. P. Adam, and ..., "Pharmacologic and nonpharmacologic treatments for urinary incontinence in women: a systematic review and network meta-analysis of clinical outcomes," Annals of internal …, 2019, doi: 10.7326/M18-3227.

[9] E. F. C. Nunes, L. M. M. Sampaio, D. A. Biasotto-Gonzalez, and ..., "Biofeedback for pelvic floor muscle training in women with stress urinary incontinence: a systematic review with meta-analysis," Physiotherapy, 2019, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S0031940618302578

[10] A. J. Huang, M. Chesney, N. Lisha, E. Vittinghoff, and ..., "A group-based yoga program for urinary incontinence in ambulatory women: feasibility, tolerability, and change in incontinence frequency over 3 months in a single …," American journal of …, 2019, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S0002937818309153

[11] M. Imamura, J. Hudson, S. A. Wallace, G. MacLennan, and ..., "Surgical interventions for women with stress urinary incontinence: systematic review and network meta-analysis of randomised controlled trials," bmj, 2019, [Online]. Available: https://www.bmj.com/content/365/bmj.l1842.abstract

[12] M. Serati, A. Braga, M. Torella, M. Soligo, and ..., "The role of urodynamics in the management of female stress urinary incontinence," Neurourology and …, 2019, doi: 10.1002/nau.23865.

[13] M. Abufaraj, T. Xu, C. Cao, A. Siyam, U. Isleem, and ..., "Prevalence and trends in urinary incontinence among women in the United States, 2005–2018," American journal of …, 2021, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S000293782100168X

[14] K. Mckellar and N. Abraham, "Prevalence, risk factors, and treatment for women with stress urinary incontinence in a racially and ethnically diverse population," Neurourol Urodyn, 2019, doi: 10.1002/nau.23930.

[15] C. T. Vaz, R. F. Sampaio, F. Saltiel, and ..., "Effectiveness of pelvic floor muscle training and bladder training for women with urinary incontinence in primary care: a pragmatic controlled trial," … journal of physical therapy, 2019, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1413355518302922

[16] V. W. Sung, D. Borello-France, D. K. Newman, H. E. Richter, and ..., "… of behavioral and pelvic floor muscle therapy combined with surgery vs surgery alone on incontinence symptoms among women with mixed urinary incontinence: the …," JAMA, 2019, [Online]. Available: https://jamanetwork.com/journals/jama/article-abstract/2749872

[17] L. P. Cacciari, C. Dumoulin, and E. J. Hay-Smith, "Pelvic floor muscle training versus no treatment, or inactive control treatments, for urinary incontinence in women: a cochrane systematic review abridged republication," … journal of physical therapy, 2019, [Online]. Available: https://www.sciencedirect.com/science/article/pii/S1413355518304465

[18] D. Franić and I. Fistonić, "Laser therapy in the treatment of female urinary incontinence and genitourinary syndrome of menopause: an update," Biomed Res Int, 2019, doi: 10.1155/2019/1576359.

[19] P.-M. Chow, Y.-C. Chuang, K.C.P. Hsu, Y.-C. Shen, and S.-P. Liu, "Impact of Female Stress Urinary Incontinence on Quality of Life, Mental Health, Work Limitation, and Healthcare Seeking in China, Taiwan, and South Korea (LUTS Asia): Results from a Cross-Sectional, Population-Based Study," *Int. J. Women's Health*, vol. 14, pp. 1871-1880, 2022. [Online]. Available: https://doi.org/10.2147/IJWH.S383651

[20] F. Alidost, R. Pakzad, M. Dolatian, and F. Abdi, "Sexual Dysfunction among Women of Reproductive Age: A Systematic Review and Meta-Analysis," *Int. J. Reprod. Biomed., 2021. [Online]. Available: https://doi.org/10.18502/ijrm.v19i5.9251

[21] A. Sukgen, A. Ellibes¸ Kaya, E. Karagün, and E. Çalışkan, "Platelet-Rich Plasma Administration to the Lower Anterior Vaginal Wall to Improve Female Sexuality Satisfaction," *J. Turk. Soc. Obstet. Gynecol.*, vol. 16, no. 4, pp. 228-234, 2020. [Online]. Available: https://doi.org/10.4274/tjod.galenos.2019.23356

[22] Y.-H. Jiang, P.-J. Lee, and H.-C. Kuo, "Therapeutic Efficacy of Urethral Sphincter Injections of Platelet-Rich Plasma for the Treatment of Stress Urinary Incontinence Due to Intrinsic Sphincter Deficiency: A Proof-of-Concept Clinical Trial," *Int. Neurourol. J., vol. 25, pp. 51-58, 2021. [Online]. Available: https://doi.org/10.5213/inj.2040272.136

[23] A.S. Dawood and H.A. Salem, "Current Clinical Applications of Platelet-Rich Plasma in Various Gynecological Disorders: An Appraisal of Theory and Practice," Clin. Exp. Reprod. Med., vol. 45, no. 2, pp. 67-74, 2018. [Online]. Available: https://doi.org/10.5653/cerm.2018.45.2.67

[24] A. Prodromidou, D. Zacharakis, S. Athanasiou, A. Protopapas, L. Michala, N. Kathopoulis, and T. Grigoriadis, "The Emerging Role on the Use of Platelet-Rich Plasma Products in the Management of Urogynaecological Disorders," Surg. Innov., vol. 29, no. 1, pp. 80-87, 2022. [Online]. Available: https://doi.org/10.1177/15533506211014848

[25] J.P.T. Higgins, J. Thomas, J. Chandler, M. Cumpston, T. Li, M.J. Page, and V.A. Welch, Eds., Cochrane Handbook for Systematic Reviews of Interventions, 2nd ed., Wiley-Blackwell: Hoboken, NJ, USA, 2020. [Online]. Available: https://doi.org/10.1002/9781119536604

[26] I.A. Apolikhina, A.V. Sokolova, A.S. Saidova, and E.A. Gorbunova, "Autologous Platelet-Rich Plasma Combined with Hyaluronic Acid Is a New Method of Minimally Invasive Treatment of Stress Urinary Incontinence in Women," Med. Sov., vol. 16, no. 2, pp. 16-20, 2018. [Online]. Available: https://doi.org/10.15556/MSO20

[27] C.-Y. Long, K.-L. Lin, C.-R. Shen, C.-R. Ker, Y.-Y. Liu, Z.-X. Loo, H.-H. Hsiao, and Y.-C. Lee, "A Pilot Study: Effectiveness of Local Injection of Autologous Platelet-Rich Plasma in Treating Women with Stress Urinary Incontinence," Sci. Rep., vol. 11, pp. 1584, 2021. [Online]. Available: https://doi.org/10.1038/s41598-020-80354-y

[28] O. Romashchenko, V. Grygorenko, V. Biloholovska, O. Babych, S. Melnykov, and L. Yakovenko, "Use of Platelet-Rich Plasma for the Treatment of Dyspareunia in Postmenopausal Women," J. Sex. Med., vol. 19, no. 4, pp. S34-S35, 2022. [Online]. Available: https://doi.org/10.1016/