Regenerative Approaches Using Platelet-Rich Plasma (PRP) and Stem Cells for Pelvic Floor Disorders: A Systematic Review

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Abstract

Background:

Pelvic floor disorders, including stress urinary incontinence, pelvic organ prolapse, fecal incontinence, and vulvovaginal atrophy, represent a major burden on quality of life. Platelet-rich plasma and platelet-rich fibrin have emerged as autologous regenerative therapies with potential applications across these conditions. This systematic review synthesized the clinical evidence from human trials of platelet-rich plasma and platelet-rich fibrin for pelvic floor disorders to evaluate efficacy, safety, and methodological quality.

Methods:

PubMed, EMBASE, and Scopus were searched from inception through 15 May 2026. Eligible studies were human clinical trials of platelet-rich plasma or platelet-rich fibrin injection for pelvic floor disorders or closely related urogynecologic conditions reporting continence, functional, quality-of-life, or safety outcomes. Study selection was performed independently by all authors, with discrepancies resolved through discussion. Risk of bias was assessed using the Cochrane Risk of Bias 2 tool for randomized trials and the Risk of Bias in Non-Randomized Studies of Interventions tool for observational studies.

Result:

Fourteen studies (663 participants) were included, comprising six randomized trials and eight prospective nonrandomized or single-arm studies. The majority addressed female stress urinary incontinence. Randomized controlled trials demonstrated significant improvements in continence questionnaires and pad tests favoring platelet-rich plasma over sham or pelvic floor muscle training. However, one placebo-controlled trial found no significant difference. Safety profiles were favorable across all studies. Risk of bias was high in single-arm studies and ranged from some concerns to low in randomized trials.

Conclusions:

Platelet-rich plasma and platelet-rich fibrin demonstrate preliminary safety and efficacy signals for pelvic floor disorders, particularly stress urinary incontinence. However, the evidence base remains limited by small sample sizes, heterogeneous protocols, and a predominance of uncontrolled studies, warranting larger, well-designed randomized controlled trials.

Introduction

Pelvic floor disorders encompass a heterogeneous spectrum of conditions including stress urinary incontinence, pelvic organ prolapse, fecal incontinence, and vulvovaginal atrophy that collectively affect an estimated one in three adult women and impose a substantial burden on physical function, psychosocial well-being, and health-related quality of life.[1–14] Stress urinary incontinence, defined as the involuntary leakage of urine during physical exertion, coughing, or sneezing, is the most prevalent subtype and is attributed to intrinsic urethral sphincter deficiency, urethral hypermobility, or both, resulting from damage to the supportive musculofascial and neurovascular structures of the pelvic floor.[3,5] Conventional management ranges from conservative pelvic floor muscle training and pessary use to surgical interventions such as midurethral sling procedures, which although effective carry risks of mesh-related complications, recurrence, and patient morbidity.[5,10] The substantial prevalence and the limitations of existing therapies have stimulated the search for minimally invasive regenerative alternatives.

Platelet-rich plasma, an autologous blood-derived concentrate enriched in growth factors, cytokines, and bioactive proteins, has been investigated across a range of musculoskeletal and soft tissue pathologies and has more recently been applied to pelvic floor disorders as a potential regenerative injection therapy.[1–14] The biological rationale centers on the capacity of platelet-derived growth factors, including transforming growth factor beta, platelet-derived growth factor, vascular endothelial growth factor, and insulin-like growth factor, to promote tissue repair, collagen synthesis, angiogenesis, and modulation of the local inflammatory milieu within the urethral sphincter complex, periurethral connective tissue, and vaginal mucosa.[3,6,7] Additionally, platelet-rich fibrin, a second-generation autologous concentrate with a three-dimensional fibrin matrix, has been applied as an adjunct to pelvic reconstructive surgery.[1] Although a growing number of phase I through III clinical trials and prospective cohort studies have reported encouraging safety and efficacy signals, the evidence base remains fragmented across diverse pelvic floor conditions, platelet-rich plasma preparation protocols, injection techniques, and outcome instruments, and no comprehensive systematic synthesis has been performed to date.

The heterogeneity of clinical protocols, the absence of standardized platelet-rich plasma preparation and delivery parameters, and the variability in outcome measures across the available studies underscore the need for a systematic appraisal of the existing evidence to identify consistent efficacy signals, characterize safety profiles, and delineate methodological limitations that should inform future trial design. Therefore, the objective of this systematic review was to comprehensively synthesize the available clinical evidence from human trials of platelet-rich plasma and platelet-rich fibrin for pelvic floor disorders, including stress urinary incontinence, pelvic organ prolapse, fecal incontinence, and vulvovaginal atrophy, with particular attention to continence and functional outcomes, quality-of-life measures, adverse event profiles, and methodological risk of bias, in order to inform clinical decision-making and the design of future adequately powered randomized controlled trials.

Methods

Search Strategy

A systematic literature search was conducted across PubMed, EMBASE, and Scopus electronic databases from inception through 15 May 2026. The search strategy combined Medical Subject Headings and free-text terms related to the population (pelvic floor disorders, stress urinary incontinence, pelvic organ prolapse, fecal incontinence, vulvovaginal atrophy, genitourinary syndrome of menopause), intervention (platelet-rich plasma, platelet-rich fibrin, autologous platelet concentrate), and outcomes (continence, cure, improvement, quality of life, pad test, adverse events). Boolean operators were

used to construct comprehensive search strings tailored to each database. Reference lists of included studies and relevant systematic reviews were manually screened to identify additional eligible publications. No date restrictions were applied; only English-language publications were included. Study selection was performed independently by all authors, and any discrepancies were resolved through consensus discussion. This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines.

Eligibility Criteria

The eligibility criteria were structured according to the Population, Intervention, Comparator, Outcomes, and Study design framework. The target population comprised human patients with pelvic floor disorders or closely related urogynecologic and vaginal conditions, including female stress urinary incontinence, recurrent pelvic organ prolapse, anal or fecal incontinence after rectal cancer surgery, vulvovaginal atrophy, and genitourinary syndrome of menopause. The intervention comprised platelet-rich plasma, autologous platelet-rich plasma, pure platelet-rich plasma, platelet-rich fibrin, platelet-rich plasma with fractional carbon dioxide laser, or platelet-rich plasma with pelvic floor muscle training. Comparators included placebo or sham saline injection, pelvic floor muscle training alone, midurethral sling surgery, carbon dioxide laser alone, combination therapy, or pre-and-post baseline comparison for uncontrolled cohorts. Outcomes of interest included continence cure or improvement rates, validated patient-reported outcome instruments (International Consultation on Incontinence Questionnaire Short Form, Incontinence Quality of Life Questionnaire, Urogenital Distress Inventory, Incontinence Impact Questionnaire, King's Health Questionnaire, Australian Pelvic Floor Questionnaire), objective measures (one-hour pad test, urodynamic parameters), quality-of-life instruments, and adverse event profiles. Eligible study designs included randomized controlled trials, prospective controlled trials, prospective cohort studies, and prospective single-arm pilot or intervention studies. Reviews, systematic or narrative reviews, animal studies, in-vitro or in-vivo investigations, meeting abstracts, protocols, and case reports were excluded.

Data Extraction

Data were extracted independently by all authors using a standardized data extraction form and any discrepancies were resolved through discussion. Extracted variables included study identification (first author, year, title, digital object identifier), study design, country and clinical setting, population characteristics (disorder or condition, sample size, sex, age), intervention details (platelet-rich plasma or platelet-rich fibrin preparation method, concentration, volume, injection site, number of sessions), comparator, outcome measures, follow-up duration, main results, adverse events, and extraction basis (full-text access status). Demographic data including age, sex distribution, body mass index, parity, menopausal status, and condition severity were extracted separately.

Risk of Bias Assessment

Risk of bias was assessed using the Cochrane Risk of Bias 2 tool for randomized controlled trials and the Risk of Bias in Non-Randomized Studies of Interventions tool for non-randomized and observational studies. Domains evaluated included the randomization process or confounding, selection and allocation, blinding and performance bias, missing outcome data, outcome measurement, and selective reporting. Each domain was judged as low risk, some concerns, or high risk, and an overall risk-of-bias judgment was assigned for each study. A rapid provisional appraisal was performed based on accessible full-text reports.

Statistical Analysis

Given the substantial heterogeneity of pelvic floor conditions, platelet-rich plasma preparation protocols, injection techniques,

comparators, and outcome instruments across the included studies, no quantitative meta-analysis or pooled statistical synthesis was performed. Had sufficient clinical and statistical homogeneity been present, the planned analytical framework included the use of a restricted maximum likelihood estimator for random-effects meta-analysis with the Hartung–Knapp–Sidik–Jonkman adjustment for confidence intervals to account for the anticipated small number of studies. For studies employing propensity score matching, planned parameters included matching on baseline covariates (age, body mass index, parity, condition severity) using nearest-neighbor matching with a caliper width of 0.2 standard deviations of the logit of the propensity score, with standardized mean differences below 0.1 accepted as indicating adequate balance. Effect sizes were to be reported as risk differences, risk ratios, and standardized mean differences where appropriate. The results of this review are therefore presented as a qualitative narrative synthesis organized by study design, condition, and outcome domain.

Results

Systematic Review

A total of 597 records were identified from PubMed (n = 195), EMBASE (n = 162), and Scopus (n = 240). After removing duplicate records (n = 44), 553 records were screened, of which 505 were excluded. Subsequently, 48 reports were sought for retrieval, and all were successfully retrieved. These 48 reports were assessed for eligibility, with 34 reports excluded for the following reasons: editorials, commentaries, and expert opinions (n = 2); studies on pelvic pain, interstitial cystitis, or overactive bladder without any SUI/POP/GSM/incontinence outcome extractable (n = 19); and mixed populations in which pelvic floor disorder subgroup data could not be disaggregated (n = 13). Finally, 14 studies were included in the review (Figure 1).[1–14] The included studies comprised six randomized trials, of which three were placebo- or sham-controlled,[8,10,12] one compared platelet-rich plasma to midurethral sling surgery,[5] one compared platelet-rich plasma plus pelvic floor muscle training to pelvic floor muscle training alone,[9] and one was a three-arm trial comparing platelet-rich plasma, fractional carbon dioxide laser, and combination therapy.[13] The remaining eight studies were prospective nonrandomized designs, including five single-arm prospective pilot or intervention studies,[2–4,6,7] one prospective observational single-arm study of platelet-rich fibrin in pelvic organ prolapse repair,[1] one prospective cohort proof-of-concept study of platelet-rich plasma for post-rectal-cancer fecal incontinence,[11] and one prospective comparative cohort study with patient-preference allocation.[14]

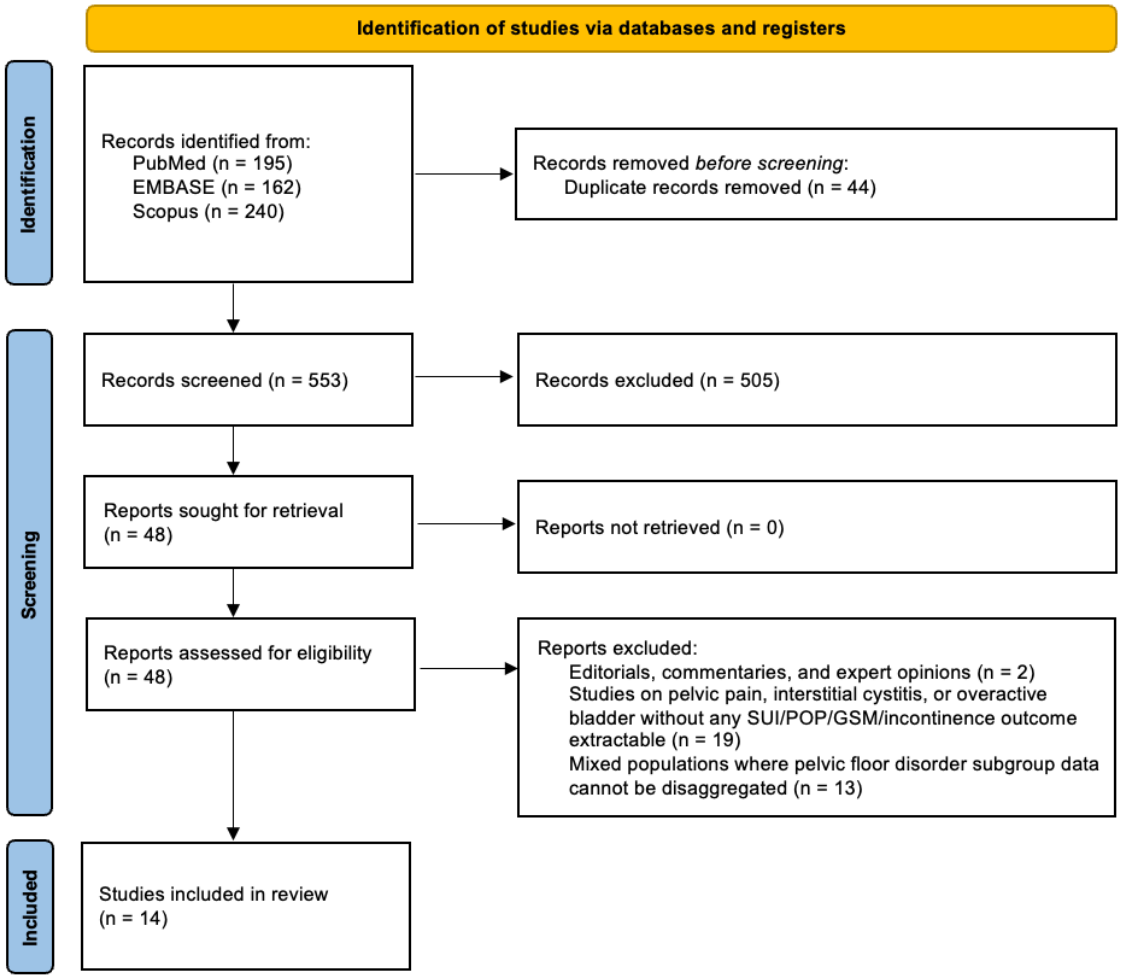

Figure 1. PRISMA Flow Chart Diagram

The fourteen included studies encompassed a total of approximately 663 participants across nine countries, with publications spanning from 2012 to 2026. The predominant condition studied was female stress urinary incontinence, addressed in eleven of fourteen studies.[2–10,13,14] One study addressed recurrent pelvic organ prolapse with platelet-rich fibrin,[1] one addressed fecal incontinence after rectal cancer surgery,[11] and one addressed postmenopausal vulvovaginal atrophy.[12] Participant ages ranged from approximately 20 to 94 years, and the study populations were predominantly female, with only two studies including male participants.[3,11] Platelet-rich plasma preparation methods varied substantially, including single and double centrifugation protocols, commercial kits (RegenKit, OMNIPLEX Gyno, RegenPRP), and varying platelet concentration targets. Injection volumes ranged from approximately 3 to 10 milliliters, and injection sites included the periurethral area, anterior vaginal wall, urethral sphincter, vaginal mucosa, and perianal sphincters. The number of treatment sessions ranged from one to four, with intervals of one to six months between sessions. Follow-up durations ranged from one month to 48 months (Table 1, Table 2).

Risk of bias assessments revealed a dichotomy between the randomized and nonrandomized studies. Among the six randomized trials, the double-blind sham-controlled trial by Grigoriadis and colleagues[8] demonstrated the most robust methodological design, with adequate randomization, double-blinding of participants and outcome assessors, and sham injection control, yielding an overall judgment of some concerns primarily related to incomplete protocol detail reporting. The placebo-controlled trial by

Ashton and colleagues[10] was similarly well-designed with low-to-some concerns. The three-arm randomized trial by Lu and colleagues[13] employed computer-generated randomization, opaque sealed envelopes, and sham procedures to maintain blinding, though no true placebo arm was included. The randomized trials by Daneshpajooh and colleagues,[5] Saraluck and colleagues,[9] and Hamid and colleagues[12] were rated at some concerns to low risk of bias. All eight nonrandomized studies were judged as having high risk of bias due to the absence of randomized comparators, lack of blinding, potential confounding, and predominantly patient-reported outcomes without independent verification (Table 3).

Table 1. Characteristics of Included Studies

Author, Year	Intervention	Comparator	Follow-up	Key Findings
Gorlero, 2012	PRF + prolapse repair	Pre/post	28 months	80% anatomical success; 100% symptom improvement at 24 months
Behnia-Willison, 2020	CO_2 laser + PRP	Pre/post	12–24 months	SUI improved in 66% at 3 months; 62% at 12–24 months
Jiang, 2021	PRP urethral sphincter ×4	Pre/post	13 months	60% success (GRA ≥2); VAS and ALPP improved significantly
Long, 2021	PRP anterior vaginal wall ×3	Pre/post	6 months	Significant ICIQ-SF/UDI-6/IIQ-7 improvement; younger trend better
Daneshpajooh, 2021	Pure PRP periurethral	Midurethral sling	3 months	70% PRP vs 80% sling negative CST; sling statistically superior
Athanasiou, 2021	PRP anterior vaginal wall ×2	Pre/post	6 months	Subjective improvement 80%; pad test reduction 50%; 10% cure at 6 months
Chiang, 2022	PRP urethral sphincter ×4	Pre/post	12 months	50% success; 46% complete continence at 3 months; 27% at final follow-up
Grigoriadis, 2024	PRP periurethral ×2	Sham saline	6 months	32% vs 4% cure; pad test −6.9 g vs +0.5 g (P<0.001)
Saraluck, 2024	A-PRP + PFMT	PFMT alone	5 months	Pad weight −8.84 g vs −0.77 g; 90% vs 14% ≥50% improvement
Ashton, 2024	Single PRP injection	Saline placebo	6 months	No significant difference; composite success 16% vs 4.5% (P=0.4)
Haksal, 2024	PRP perianal sphincter	Pre/post	48 months	35% Wexner improvement; squeezing pressure improved (P=0.01)
Hamid, 2025	PRP vaginal mucosa	Saline placebo	4 months	FSFI 19.0±4.5 PRP vs 9.7±4.3 placebo; QoL significantly improved
Lu, 2025	PRP ± CO_2 laser	Laser alone	6 months	Combination > laser for ICIQ-SF/I-QOL/pad test; PRP alone ≈ laser
Borislavschi, 2026	PRP periurethral ×3	PFMT	Variable	VAS improved more with PRP; KHQ progressive improvement over 3 injections

Table 2. Demographic Characteristics of Included Studies

Author, Year	Country	N	Age (years)	Sex	BMI (kg/m²)	Condition
Gorlero, 2012	Italy	10	62.7 (55–71)	Women	27 (21–35)	Recurrent POP stage ≥II
Behnia-Willison, 2020	Australia	62	55.98±11.27	Women	65% obese	Female SUI
Jiang, 2021	Taiwan	35	68.7±12.0	30M/5F	NR	SUI due to ISD
Long, 2021	Taiwan	20	44.5	Women	22.7	Female SUI
Daneshpajooh, 2021	Iran	20	46–51 (by group)	Women	NR	Female SUI
Athanasiou, 2021	Greece	20	56.5±8.3	Women	27.1±2.7	Female SUI/severe USI
Chiang, 2022	Taiwan	26	61.7±15.3	Women	NR	Female SUI/ISD
Grigoriadis, 2024	Greece	50	PRP 55.4; sham 57.2	Women	PRP 26.5; sham 26.1	Female SUI/USI
Saraluck, 2024	Thailand	64 (60 analyzed)	52.4 vs 51.8	Women	26.8 vs 24.0	Mild–moderate SUI
Ashton, 2024	USA	50 (47 analyzed)	Median 48 vs 45	Women	Median 29 vs 28	Female SUI
Haksal, 2024	Turkey	20	56.8±9.5	14M/6F	29.6±3.4	Fecal incontinence
Hamid, 2025	Egypt	60	NR	Women	NR	Vulvovaginal atrophy
Lu, 2025	China	78 (69 analyzed)	30–60 (inclusion)	Women	NR	Mild–moderate SUI
Borislavschi, 2026	Romania	169	60.3 vs 68.2	Women	26.6 vs 27.4	Female SUI

Table 3. Risk of Bias Assessment

Author, Year	Tool	D1: Random./Confound.	D2: Selection	D3: Blinding	D4: Missing Data	D5: Measurement	Overall
Gorlero, 2012	ROBINS-I	High	High	High	Low/Unclear	Some concerns	High
Behnia-Willison, 2020	ROBINS-I	High	High	High	Some concerns	Some concerns	High
Jiang, 2021	ROBINS-I	High	High	High	Low/Unclear	Some concerns	High
Long, 2021	ROBINS-I	High	High	High	Low	Some concerns	High
Daneshpajooh, 2021	RoB 2	Low/Some	Some concerns	Some concerns	Low/Some	Some concerns	Some concerns
Athanasiou, 2021	ROBINS-I	High	High	High	Low	Some concerns	High
Chiang, 2022	ROBINS-I	High	High	High	Low/Unclear	Some concerns	High
Grigoriadis, 2024	RoB 2	Low	Low/Some	Low	Low	Some concerns	Some concerns
Saraluck, 2024	RoB 2	Low/Some	Some concerns	Some concerns	Low/Some	Some concerns	Some concerns
Ashton, 2024	RoB 2	Low/Some	Some concerns	Some concerns	Low/Some	Low/Some	Some concerns

Haksal, 2024	ROBINS-I	High	High	High	Low/Unclear	Some concerns	High
Hamid, 2025	RoB 2	Low/Some	Low/Some	Low/Some	Low	Some concerns	Some concerns
Lu, 2025	RoB 2	Low	Low	Low/Some	Some concerns	Some concerns	Some concerns
Borislavschi, 2026	ROBINS-I	High	High	High	Low/Unclear	Some concerns	High

Discussion

This systematic review identified fourteen human clinical studies of platelet-rich plasma and platelet-rich fibrin for pelvic floor disorders, encompassing six randomized trials and eight prospective nonrandomized studies across nine countries and approximately 663 participants. The principal finding was that the majority of studies reported favorable efficacy signals, with significant improvements in validated continence questionnaires, pad test results, and quality-of-life measures following platelet-rich plasma injection for stress urinary incontinence. The sham-controlled randomized trial by Grigoriadis and colleagues[8] provided the strongest evidence, demonstrating a subjective cure rate of 32% versus 4% and a statistically significant reduction in pad test urine loss favoring platelet-rich plasma. However, the placebo-controlled trial by Ashton and colleagues[10] found no statistically significant difference with a single platelet-rich plasma injection, highlighting the potential importance of multiple treatment sessions and injection technique. Safety profiles were uniformly favorable, with no serious adverse events reported across any included study.

The findings of this systematic review extend the preliminary conclusions of prior narrative reviews on platelet-rich plasma in urogynecology. The randomized trial by Saraluck and colleagues[9] demonstrated that platelet-rich plasma combined with pelvic floor muscle training produced substantially greater improvements in pad test weight reduction and quality of life compared to pelvic floor muscle training alone, suggesting a synergistic benefit of combining regenerative injection with structured rehabilitation. The head-to-head comparison by Daneshpajooh and colleagues[5] demonstrated that midurethral sling surgery produced statistically superior continence outcomes compared to platelet-rich plasma at three months, positioning platelet-rich plasma as a potentially complementary rather than replacement therapy for surgical intervention. The application of platelet-rich fibrin by Gorlero and colleagues[1] in recurrent pelvic organ prolapse repair, the perianal sphincter injection by Haksal and colleagues[11] for post-rectal-cancer fecal incontinence, and the vaginal mucosal injection by Hamid and colleagues[12] for vulvovaginal atrophy collectively demonstrate the expanding scope of autologous platelet concentrate applications across the pelvic floor disorder spectrum, although each of these applications requires further validation in larger controlled studies.

The pelvic floor is a complex musculofascial and ligamentous structure comprising the levator ani muscle group (pubococcygeus, puborectalis, and iliococcygeus), the endopelvic fascia, and the urethral sphincter complex, which collectively provide structural support for the pelvic viscera and contribute to the continence mechanism through active muscular contraction and passive connective tissue support. In stress urinary incontinence, this architecture is disrupted through a combination of mechanical injury during vaginal delivery, progressive connective tissue degradation associated with estrogen deficiency and aging, and neuromuscular denervation, resulting in urethral sphincter insufficiency and loss of the pressure transmission mechanism that normally maintains urethral closure during abdominal pressure increases. Platelet-rich plasma exerts its regenerative effects at this pathobiological interface through the concentrated delivery of platelet alpha-granule contents, including transforming growth factor beta-1 which stimulates fibroblast proliferation and extracellular matrix deposition, platelet-derived growth factor which promotes mesenchymal cell recruitment and angiogenesis, vascular endothelial growth factor which enhances neovascularization of ischemic periurethral tissue, and insulin-like growth factor-1 which supports smooth muscle cell hypertrophy and connective tissue remodeling within the

urethral sphincter complex. The observed clinical improvements in continence questionnaire scores and pad test measurements are therefore mechanistically coherent with growth-factor-mediated restoration of periurethral connective tissue integrity, enhancement of urethral coaptation, and potential neurotrophic support for the sphincter complex. The rationale for platelet-rich fibrin as a surgical adjunct in pelvic organ prolapse repair rests on the sustained release kinetics of its three-dimensional fibrin scaffold, which provides a prolonged growth-factor delivery matrix at the surgical repair site, thereby promoting organized collagen deposition, reducing fibrosis-related complications, and enhancing the biomechanical integrity of the reconstructed fascial support.

The clinical applicability of the current evidence base is conditioned by several important considerations. First, the diversity of platelet-rich plasma preparation protocols, including single versus double centrifugation, varying platelet concentration targets (2.5-fold to 9-fold enrichment), use of commercial kits versus manual processing, and activation with calcium chloride versus no activation, precludes definitive recommendations regarding optimal preparation parameters. Second, injection techniques varied substantially across studies, encompassing periurethral, anterior vaginal wall, urethral sphincter, vaginal mucosal, and perianal injection sites, with varying volumes (3 to 10 milliliters) and numbers of injection sessions (one to four), making direct comparisons across studies challenging. Third, the negative result of the placebo-controlled trial by Ashton and colleagues[10] using a single injection contrasts with the positive results of trials using multiple sessions, suggesting that dose frequency may be a critical determinant of treatment response. Fourth, the longest available follow-up data, from the perianal sphincter study by Haksal and colleagues[11] extending to 48 months and the prolapse study by Gorlero and colleagues[1] extending to 28 months, provide preliminary evidence of treatment durability, although the mid-term follow-up data from Chiang and colleagues[7] demonstrated attenuation of initial continence gains from 46% at three months to 27% at final follow-up, indicating that treatment effects may diminish over time and repeat sessions may be necessary.

This systematic review has several limitations that warrant acknowledgment. First, the majority of included studies were small single-arm prospective studies without randomized comparators, carrying high risk of bias and precluding definitive causal inference. Second, the substantial heterogeneity across included studies in terms of pelvic floor conditions, platelet-rich plasma preparation and delivery protocols, comparators, outcome instruments, and follow-up durations precluded quantitative meta-analysis and limits the strength of cross-study comparisons. Third, only six of fourteen studies employed randomized designs, and even among these, sample sizes were modest (20 to 78 participants), limiting statistical power and the precision of effect estimates. Fourth, the predominantly female and condition-specific populations limit the generalizability of the findings. Fifth, publication bias cannot be excluded, as small negative studies may be underrepresented in the published literature. Sixth, the heterogeneity of platelet-rich plasma preparation protocols, including variable platelet concentrations, activation methods, and injection techniques, introduces a substantial source of between-study variability that confounds interpretation. Finally, adverse event reporting was incomplete in several studies, with one randomized trial not explicitly reporting safety outcomes in the main text, limiting the comprehensiveness of the safety assessment.

Conclusion

This systematic review of fourteen human clinical studies of platelet-rich plasma and platelet-rich fibrin for pelvic floor disorders demonstrates that these autologous regenerative therapies are generally safe and associated with encouraging preliminary efficacy signals, particularly for stress urinary incontinence. The strongest evidence emerges from

sham-controlled randomized trials demonstrating significant improvements in continence outcomes and pad test measurements, although one placebo-controlled trial using a single injection protocol found no significant benefit. The evidence base remains limited by small sample sizes, heterogeneous preparation and injection protocols, a predominance of uncontrolled study designs, and insufficient standardization of outcome measures, collectively precluding definitive clinical recommendations. Future well-designed, adequately powered, multicenter randomized controlled trials with standardized platelet-rich plasma preparation parameters, optimized injection protocols, and long-term follow-up are essential to establish the role of autologous platelet concentrates in the treatment algorithm for pelvic floor disorders.

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Author's Statement

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