


Efficacy of Governor Vessel–Based Acupuncture, Alone or in Combination with Other Therapies, for Acute Lumbar Disc Herniation: A Systematic Review and Meta-Analysis

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Abstract: This study systematically evaluated the efficacy of Governor Vessel–based acupuncture for lumbar disc herniation (LDH) and examined whether different acupuncture paradigms or combined interventions offered additional benefits. A comprehensive search of nine major databases identified 689 records, and 15 randomized controlled trials involving 670 patients met the inclusion criteria. Meta-analysis demonstrated that Governor Vessel–based acupuncture significantly improved overall clinical effectiveness compared with control treatments (RR = 1.21, 95% CI: 1.15–1.27), with a stable predictive interval. Pain intensity was also markedly reduced, as evidenced by a substantial decrease in visual analogue scale scores (SMD = –1.77, 95% CI: –2.18 to –1.36). Subgroup analyses revealed no meaningful differences among Wenyang Tongdu, spine-regulating Governor Vessel, and Bushen–Huoxue techniques, nor between acupuncture alone and combined modalities. These findings indicate that Governor Vessel–based acupuncture provides consistent and clinically relevant benefits for patients with LDH. However, methodological heterogeneity and the limited number of single-modality Governor Vessel trials should be considered when interpreting these findings. Nevertheless, higher-quality multicenter randomized trials are needed to validate long-term outcomes and clarify mechanistic pathways.

Keywords: lumbar disc herniation, governor vessel–oriented acupuncture, neuromodulation, inflammatory modulation, visual analogue scale, pain management

Introduction

Lumbar disc herniation (LDH) is one of the most common degenerative disorders of the spine and is a leading cause of low back and leg pain in adults. Its lifetime prevalence is estimated at 12–30%, particularly affecting working-age populations and imposing substantial socioeconomic and healthcare burdens.¹ Globally, low back pain represents the leading cause of years lived with disability, and lumbar disc pathology accounts for a major proportion of clinically significant cases worldwide, making LDH a major international public health concern. The underlying pathophysiology involves mechanical compression of the nerve root, narrowing of the intervertebral foramen, and activation of local inflammatory pathways. Contemporary imaging and neurobiological evidence further highlight the contribution of inflammatory mediators—including interleukin-6 (IL-6), tumor necrosis factor- α (TNF- α), and matrix metalloproteinase-3 (MMP-3)—to radicular pain, making the modulation of neuroinflammation and the spine–nerve interface key therapeutic targets.²

Conventional treatments for LDH include nonsteroidal anti-inflammatory drugs (NSAIDs), traction, epidural steroid injections, physical therapy, and, in selected cases, minimally invasive or open surgery. However, clinical management strategies differ substantially across countries: Western healthcare systems primarily emphasize pharmacological,

rehabilitative, and surgical approaches, whereas acupuncture is more commonly incorporated into routine LDH management in East Asian countries as part of integrative medical models. Pharmacological treatments may provide short-term relief but are often limited by gastrointestinal or cardiovascular side effects and variable patient tolerance.³ Surgical decompression offers rapid improvement for some patients, yet concerns remain regarding recurrence, long-term outcomes, and suitability for non-severe presentations.⁴ These limitations have stimulated growing interest in integrating nonpharmacological therapies into modern multidisciplinary pain management.

Acupuncture has been widely used in LDH management because of its well-documented analgesic effects, regulation of neuromuscular tension, and modulation of neuroimmune activity. Experimental and clinical studies have demonstrated that acupuncture can inhibit peripheral and central sensitization, downregulate pro-inflammatory mediators (such as TNF- α , IL-1 β , and IL-6), promote endogenous opioid release, and regulate spinal–supraspinal pain pathways, thereby alleviating radicular pain and functional impairment.^{5–7}

Among acupuncture systems, Governor Vessel–based approaches, such as Tongdu therapy, Wenyang Tongluo techniques, Bushen–Huoxue methods, and spine-regulating Governor Vessel strategies have gained growing clinical interest.^{8–11} The Governor Vessel runs along the posterior midline of the body and anatomically overlies the spinous processes, paraspinal muscles, spinal nerves, and posterior spinal structures.¹² Modern neuroanatomical and neurophysiological evidence suggests that stimulation of points along the Governor Vessel can influence spinal segmental reflexes, paraspinal muscle tone, microcirculation, and neuroimmune signaling, making it a biologically plausible and anatomically relevant therapeutic target for lumbar disc herniation.^{12,13}

From a mechanistic perspective, needling Governor Vessel–related points may activate paraspinal muscle reflexes,¹⁴ reduce pathological muscle guarding,¹⁵ promote microcirculatory improvement,¹⁶ and enhance the release of endogenous analgesic peptides such as β -endorphin.¹⁷ Experimental studies also suggest downregulation of pro-inflammatory mediators, providing a plausible biological basis for pain reduction.^{6,18}

In clinical practice, these techniques are often combined with traction, bloodletting-cupping, extracorporeal shock-wave therapy, or massage, forming multimodal treatment strategies.¹ This integrative approach is commonly adopted to enhance overall therapeutic efficacy and to address the multifactorial pathophysiology of lumbar disc herniation, including pain, inflammation, and neuromuscular dysfunction, rather than because these acupuncture techniques are ineffective when used alone. However, current evidence largely originates from small, single-center randomized trials with heterogeneous interventions, inconsistent reporting, and variable methodological rigor.^{19,20} Rather than excluding such studies, the present review seeks to address this limitation by explicitly incorporating them and applying predefined subgroup analyses to disentangle the effects of Governor Vessel–based acupuncture when used alone or in combination with other therapies. Consequently, important questions remain unresolved, including the comparative efficacy of different Governor Vessel–based acupuncture paradigms, the magnitude of their analgesic benefits, and whether combined interventions provide additional therapeutic value.^{21,22}

To address these uncertainties, we conducted a systematic review and meta-analysis of randomized controlled trials evaluating Governor Vessel–based acupuncture for LDH. The analysis synthesized evidence on clinical effectiveness, pain reduction measured by the visual analogue scale (VAS), and functional improvement. Subgroup analyses were performed to compare distinct acupuncture paradigms and treatment modes. Risk-of-bias assessment, sensitivity analyses, and publication bias evaluation were incorporated to ensure the robustness of the findings. This study aims to provide comprehensive and high-quality evidence to support the clinical application, standardization, and further refinement of Governor Vessel–based acupuncture in LDH management.

Methods

Literature Search Strategy

This systematic review and meta-analysis were conducted in accordance with the PRISMA 2020 guidelines. A comprehensive search of PubMed, Web of Science, CNKI, Wanfang, VIP, CBM, Embase, AMED, and CINAHL Plus databases were performed from inception to January 2026. The search strategy combined controlled vocabulary terms and free-text keywords related to lumbar disc herniation, acupuncture and randomized controlled trials, using

appropriate Boolean operators. Search strategies were adapted for each database. Full electronic search strategies are provided in [Supplementary Table S1](#). Additional manual searches of reference lists, reviews, clinical guidelines, and grey literature were conducted to minimize omissions. All retrieved records were imported into EndNote for automatic and manual duplication. The overall search and screening procedure is shown in [Figure 1](#).

Inclusion and Exclusion Criteria

Studies were included if they met all the following conditions:

(1) Study design: randomized controlled trials (RCTs); (2) Participants: patients diagnosed with lumbar disc herniation based on clearly defined clinical or radiological criteria; (3) Interventions: experimental groups treated with Governor Vessel-based acupuncture techniques, including Wenyang Tongluo acupuncture, Bushen–Huoxue acupuncture, spine-regulating Governor Vessel therapy, Tongdu-based analgesic techniques, or related systems, administered alone or

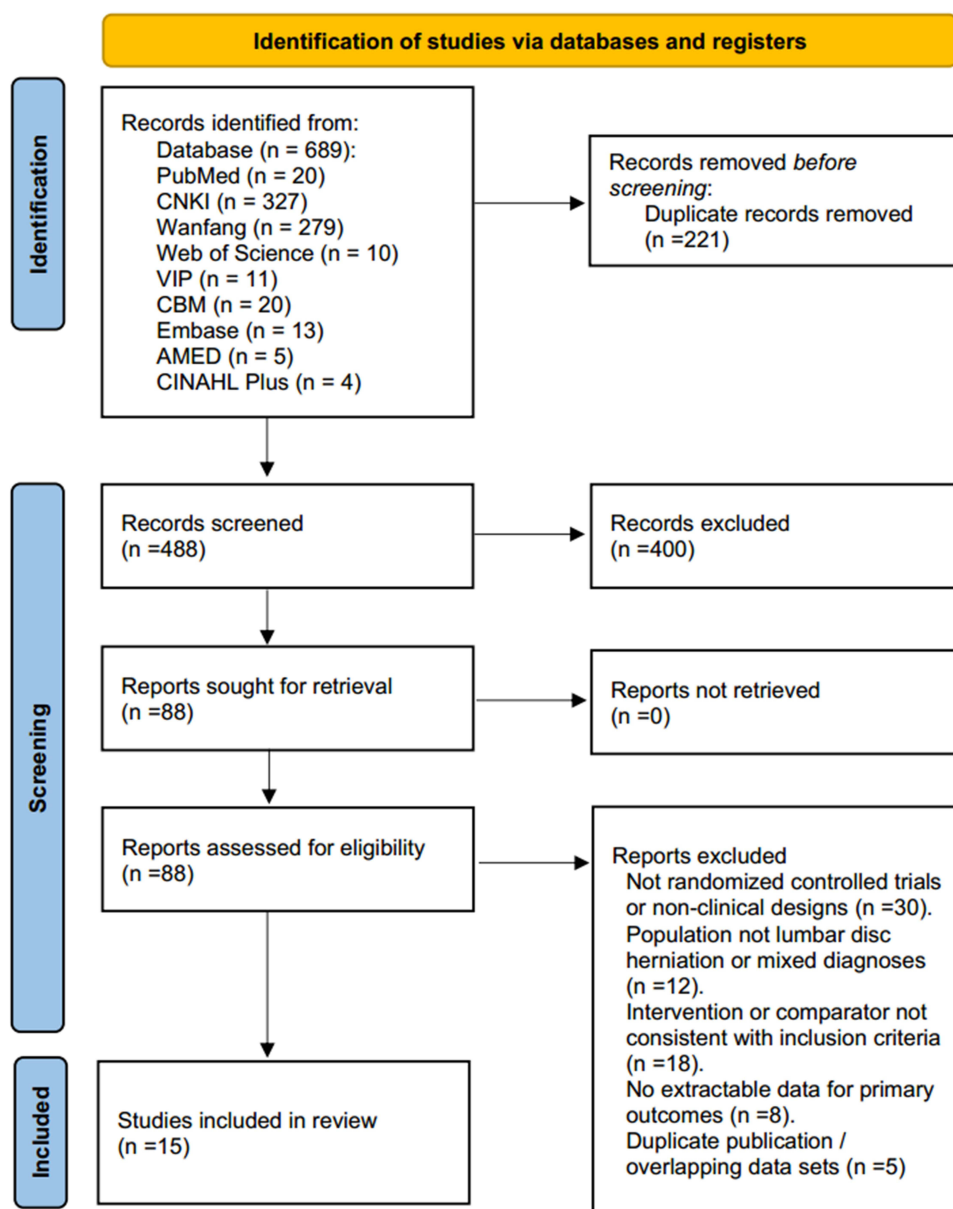


Figure 1 PRISMA flow diagram. Flow diagram summarizing the identification, screening, eligibility assessment, and final inclusion of randomized controlled trials. A total of 689 records were retrieved; 15 studies met eligibility criteria and were included in the meta-analysis.

combined with adjunctive therapies such as traction, cupping, shockwave therapy, acupoint massage, or topical herbal applications. Combined-intervention trials were included to reflect real-world practice and to enable predefined subgroup analyses (acupuncture alone vs combined therapy; (4) Comparators: conventional acupuncture, routine acupuncture, physiotherapy, NSAIDs, standard Western medical treatment, traction, or any other recognized control intervention; (5) Outcomes: reporting at least one core endpoint, including overall clinical effectiveness or visual analogue scale (VAS) pain scores; (6) Data availability: studies reporting extractable quantitative data for at least one prespecified outcome, including sample size and effect estimates (eg, means and standard deviations), either directly reported or obtainable through standard data extraction or conversion methods.

Studies were excluded if any of the following conditions applied:

(1) Reviews, case reports, expert opinions, or experience-based articles; (2) mixed or poorly defined interventions where the independent effect of Governor Vessel-based acupuncture could not be determined; (3) absence of core outcome data or inability to extract effect-size information; (4) duplicate publications or studies with overlapping datasets; (5) studies irrelevant to the clinical question or not involving Governor Vessel-related acupuncture modalities.

Study Selection and Data Extraction

Two reviewers independently screened titles, abstracts, and full texts against predefined criteria, resolving disagreements through discussion with a third reviewer. Extracted data included author, year of publication, sample size, age, disease duration, intervention and control details, treatment frequency and duration, study design characteristics, and primary outcomes. When outcome data were incomplete, values were inferred from graphs or tables, or attempts were made to contact the original authors. Ultimately, a total of 15 randomized controlled trials^{23–37} were included in the final quantitative synthesis. (Figure 1)

Risk-of-Bias Assessment

Risk of bias was assessed using the Cochrane Risk of Bias 2 (RoB 2) tool for randomized trials. Each included study was evaluated across five domains: bias arising from the randomization process, bias due to deviations from intended interventions, bias due to missing outcome data, bias in measurement of the outcome, and bias in selection of the reported result. Two reviewers independently performed the assessment, and disagreements were resolved through discussion.

Using the RoB 2 tool, most included studies were judged to have a low risk of bias across several domains; however, some concerns were identified in specific domains, particularly related to the randomization process and selective reporting. One study was rated as having a high risk of bias in the randomization process due to insufficient reporting of random sequence generation. Overall, most studies were judged to have a low overall risk of bias, with one study classified as high risk (Figure 2).

Evidence Quality Assessment

The certainty of evidence for key outcomes was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. Evidence was evaluated across five domains, including risk of bias, inconsistency, indirectness, imprecision, and other considerations. The GRADEpro GDT online tool (<https://gradepr.org/>) was used to generate a structured Summary of Findings table. Overall clinical effectiveness and pain intensity measured by the visual analogue scale (VAS) were prespecified as critical outcomes.

Statistical Analysis

Meta-analyses were performed using Review Manager 5.4 and R version 4.3.1 (meta and metafor packages). For dichotomous outcomes such as overall clinical effectiveness, risk ratios (RRs) with 95% confidence intervals (CIs) were calculated. For continuous outcomes such as VAS scores, standardized mean differences (SMDs) were applied due to variations in measurement scales across studies. Heterogeneity was assessed using Cochran's Q test and the Higgins I² statistic, with fixed-effects models used when I² ≤ 50% and random-effects models applied when I² > 50%. Predefined subgroup analyses examined differences across acupuncture paradigms and treatment modes (acupuncture alone vs

Study	Risk of bias domains					Overall
	D1	D2	D3	D4	D5	
Fang F (2025)	+	+	+	+	+	+
Hong QY (2017)	+	+	+	+	+	+
Liu PP (2024)	+	+	+	+	-	+
Liu TJ (2025)	+	+	+	+	-	+
Liu XY (2024)	+	+	-	+	+	+
Lu HF (2020)	+	+	-	+	+	+
Qi HW (2024)	+	+	+	+	+	+
Song T (2023)	+	+	+	+	+	+
Wang JR (2024)	-	+	+	-	+	+
Zhan Y (2024)	-	+	+	+	+	+
Zhang SS (2021)	X	+	+	+	+	X
Zhang XQ (2024)	+	-	+	+	+	+
Zhao L (2020)	+	-	+	+	-	+
Zhao YH (2015)	+	+	+	+	-	+
Zhu LQ (2024)	+	+	+	+	-	+

Domains:
 D1: Bias arising from the randomization process.
 D2: Bias due to deviations from intended intervention.
 D3: Bias due to missing outcome data.
 D4: Bias in measurement of the outcome.
 D5: Bias in selection of the reported result.

Judgement
 X High
 - Some concerns
 + Low

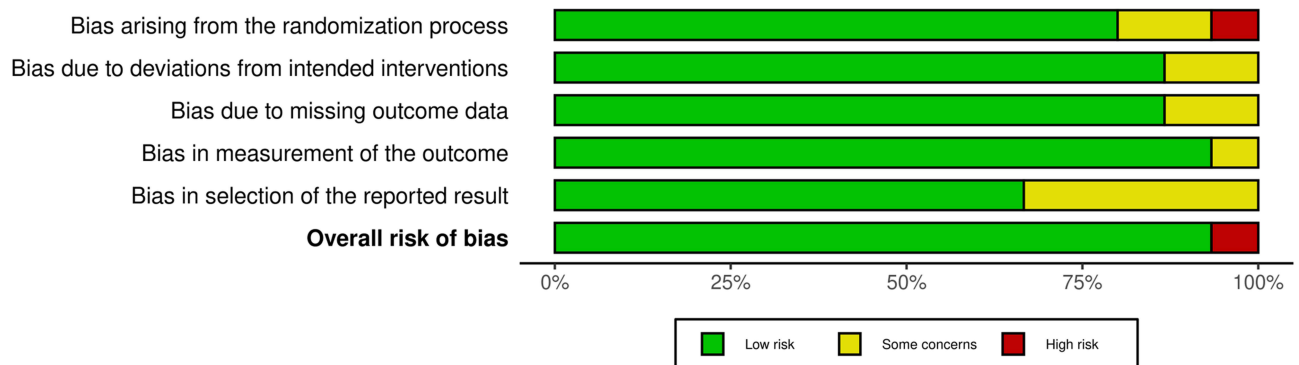


Figure 2 Risk-of-bias assessment of included studies. Risk of bias of the included randomized controlled trials was assessed using the Cochrane Risk of Bias 2 (RoB 2) tool across five domains: (D1) bias arising from the randomization process; (D2) bias due to deviations from intended interventions; (D3) bias due to missing outcome data; (D4) bias in measurement of the outcome; and (D5) bias in selection of the reported result. The upper panel presents the traffic light plot showing domain-level judgments for each individual study, while the lower panel summarizes the overall distribution of risk of bias judgments across studies. Green indicates low risk of bias, yellow indicates some concerns, and red indicates high risk of bias.

combined therapy). Sensitivity analysis was conducted using a leave-one-out approach, and publication bias was assessed using funnel plots. Statistical significance was defined as a two-sided P value < 0.05.

Results

Balanced Baseline Profiles

A total of 15 randomized controlled trials involving 670 patients with lumbar disc herniation were included (Figure 1). Across studies, sample size, intervention characteristics, and outcome measures demonstrated good overall comparability. Participants were predominantly middle-aged adults, with mean ages ranging from approximately 41 to 53 years across treatment and control groups. Disease duration was moderately consistent, spanning 2 to 6 weeks in most trials, with only one study reporting a 1-month course.

Interventions were categorized into three major Governor Vessel-related acupuncture systems—GV-warming–Yang/Tongluo, spine-regulating GV, and tonifying-kidney/activating-blood techniques—either applied alone or combined with adjunctive therapies such as bloodletting-cupping, radial shockwave therapy, lumbar traction, acupoint massage, or herbal plaster. Comparator groups primarily received conventional acupuncture, routine conservative care, NSAIDs, lumbar traction, or meloxicam with epidural block. Among the included studies, only four trials employed single-modality Governor Vessel-based acupuncture, whereas the majority applied combined interventions. Accordingly, comparisons between integrated and independent strategies were exploratory in nature, and the limited number of single-modality studies may restrict the precision of efficacy estimates (Table 1).

Reporting of allocation concealment and blinding was limited; however, risk-of-bias assessment (Figure 2) indicated that most studies presented low risk in selective reporting and incomplete outcome data. Random sequence generation was generally rated as low to moderate risk. Taken together, the baseline characteristics across studies were broadly balanced between groups, and the methodological quality of the included trials was acceptable for quantitative synthesis.

Tongdu-Related Acupuncture Significantly Improved Overall Clinical Effectiveness

All trials demonstrated higher clinical effectiveness rates in the Governor Vessel-based acupuncture group compared with controls. The fixed-effects model showed a statistically significant improvement in overall effectiveness (RR = 1.21, 95% CI 1.15–1.27; $P < 0.0001$) with negligible heterogeneity ($I^2 = 0\%$) (Figure 3). The prediction interval (1.15–1.28) further suggests that this therapeutic benefit is likely to persist across future studies. These findings indicate a consistent short-term symptomatic improvement associated with Tongdu-based acupuncture therapies.

Comparable Effectiveness Across Different Tongdu-Based Acupuncture Systems

Based on underlying theoretical principles, trials were categorized into GV-warming–Yang/Tongluo, spine-regulating GV, and tonifying-kidney with activating-blood systems. All subgroups demonstrated significant therapeutic advantage over controls. Between-group differences were not statistically significant ($P = 0.8038$) (Figure 3), indicating that despite variations in manipulation techniques and conceptual frameworks, different Tongdu-related acupuncture systems achieve largely consistent clinical outcomes. This suggests a shared therapeutic mechanism grounded in spinal functional regulation and meridian modulation.

Combination Therapies Showed a Tendency Toward Enhanced Benefit but without Significant Superiority

Some trials used acupuncture alone, whereas others integrated traction, bloodletting, shock-wave therapy, or manual manipulation. Subgroup analysis showed slightly larger effect sizes in combined-therapy trials (RR = 1.22) compared with single-technique acupuncture (RR = 1.18), although the difference was not significant ($P = 0.6112$) (Figure 4). These findings suggest that while multimodal strategies may reinforce therapeutic effects, standalone Tongdu acupuncture already provides a substantial clinical benefit, and current evidence does not establish the superiority of combined interventions.

Table 1 Baseline Characteristics and Treatment Profiles Included Randomized Controlled Trials

Study ID	Sample Size (T/C)	Age (T/C, Mean \pm SD)	Duration	Intervention (T)	Comparator (C)	Combine Type
Fang F (2025)	42/42	65.64 \pm 3.15/66.79 \pm 3.23	6 weeks	GV-warming-Yang / Tongluo + acupoint massage + conventional conservative therapy	Conventional acupuncture	Combined
Hong QY (2017)	45/45	42.5 \pm 7.3/43.8 \pm 8.6	3 weeks	Spine-regulating GV	Ibuprofen sustained-release capsules	Single
Liu PP (2024)	30/30	43.17 \pm 7.20/42.27 \pm 7.78	3 weeks	Tonifying-kidney	Conventional acupuncture	Single
Liu TJ (2025)	45/45	48.78 \pm 8.24/45.69 \pm 8.42	1 month	Tonifying-kidney+ radial shockwave therapy	Radial shockwave therapy	Combined
Liu XY (2024)	34/34	48.12 \pm 5.03/48.21 \pm 5.12	4 weeks	GV-warming-Yang / Tongluo + pricking-bloodletting + cupping	Lumbar traction	Combined
Lu HF (2020)	43/43	53.16 \pm 8.27/53.62 \pm 7.59	3 weeks	GV-warming-Yang / Tongluo + Weizhong bloodletting-cupping	Tongdu–Bushen–Huoxue acupuncture	Combined
Qi HW (2024)	42/42	41.96 \pm 4.74/42.63 \pm 4.85	3 weeks	GV-warming-Yang / Tongluo + pricking-bloodletting + cupping	Pricking–bloodletting–cupping alone	Combined
Song T (2023)	40/40	46.54 \pm 8.26/46.54 \pm 8.26	6 weeks	Spine-regulating GV+Lumbar traction	Lumbar stabilization training	Combined
Wang JR (2024)	62/62	42.88 \pm 5.37/42.88 \pm 5.37	4 weeks	Spine-regulating GV + shockwave + lumbar stabilization training	Lumbar stabilization training	Combined
Zhan Y (2025)	68/68	41.35 \pm 6.94/40.65 \pm 6.38	2 weeks	Spine-regulating GV	Meloxicam + epidural block	Single
Zhang SS (2021)	49/49	50.27 \pm 4.95/49.96 \pm 5.52	3 weeks	Spine-regulating GV + bloodletting-cupping	Tongdu–Bushen–Huoxue acupuncture	Combined
Zhang XQ (2024)	40/40	67.32 \pm 5.12/66.89 \pm 5.30	2 weeks	Spine-regulating GV acupuncture	Wenyang Tongluo therapy	Combined
Zhao L (2020)	43/43	46.48 \pm 4.68 vs 46.35 \pm 4.74	2 weeks	Tonifying-kidney + Activating-blood + Chinese herbal plaster	Conventional acupuncture	Combined
Zhao YH (2015)	40/40	40.92 \pm 9.1/42.3 \pm 7.9	6 weeks	Tonifying-kidney	Conventional acupuncture	Single
Zhu LQ (2024)	47/47	42.84 \pm 6.43/43.76 \pm 6.72	4 weeks	Tonifying-kidney + Activating-blood+Weizhong bloodletting	Conventional acupuncture	Combined

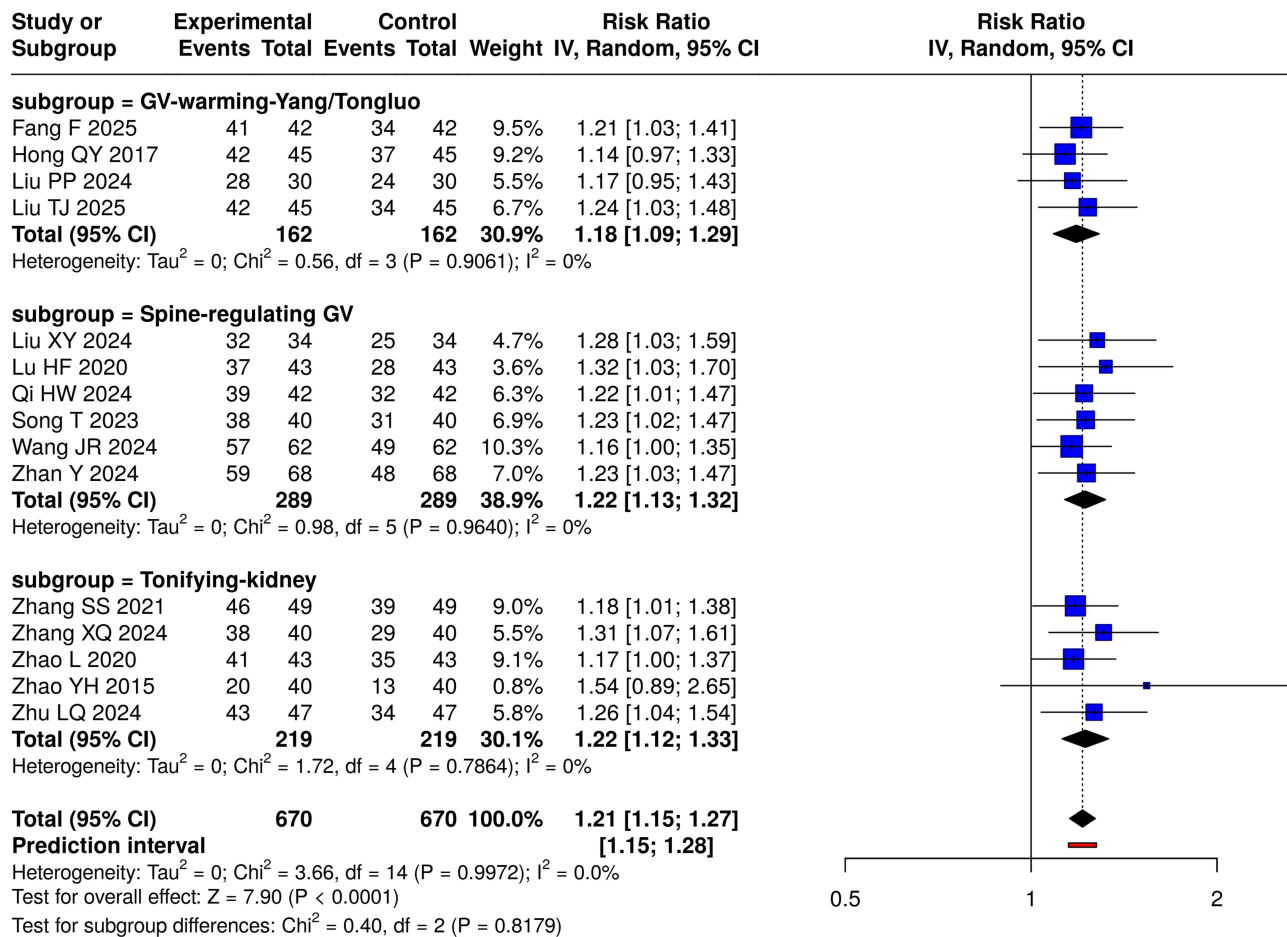


Figure 3 Overall and subgroup meta-analysis of clinical effectiveness. Forest plot comparing overall clinical effectiveness between Governor Vessel–based acupuncture and control interventions. Subgroup analyses stratified by GV-warming–Yang/Tongluo, spine-regulating GV, and tonifying-kidney/activating-blood techniques showed consistently favorable effects across all systems. RRs are presented with 95% CIs. Squares represent individual study estimates, with the size of the square proportional to study weight. Horizontal lines indicate 95% CIs. Diamonds represent pooled effect estimates. The vertical solid line indicates no effect (RR = 1). Bold values indicate pooled results. Prediction interval is shown in red.

Tongdu-Based Acupuncture Produced Significant Reductions in Pain Intensity (VAS)

Fourteen trials reported changes in VAS scores. Pooled results demonstrated a significant reduction in pain in the acupuncture group (SMD = -1.77, 95% CI -2.18 to -1.36; P < 0.0001) (Figure 5). Despite substantial heterogeneity (I² = 88.1%), all individual studies favored acupuncture over control interventions. Differences in treatment duration, baseline pain severity, and auxiliary modalities likely contributed to heterogeneity but did not affect the overall trend toward pain alleviation.

Analgesic Effects of Governor Vessel Based Acupuncture Alone or in Combination for Lumbar Disc Herniation

Subgroup analysis showed that both single acupuncture and acupuncture combined with other therapies significantly reduced pain compared with control treatments. The overall pooled effect favored Governor Vessel–based acupuncture (SMD = -1.77, 95% CI -2.18 to -1.36, P < 0.001) (Figure 6), with substantial heterogeneity (I² = 88.1%). No significant difference was observed between the two subgroups (P = 0.27).

Certainty of Evidence According to the GRADE Approach

The certainty of evidence for the key outcomes was assessed using the GRADE approach (Table 2). The evidence for both overall clinical effectiveness and pain intensity measured by VAS was rated as low, mainly due to methodological

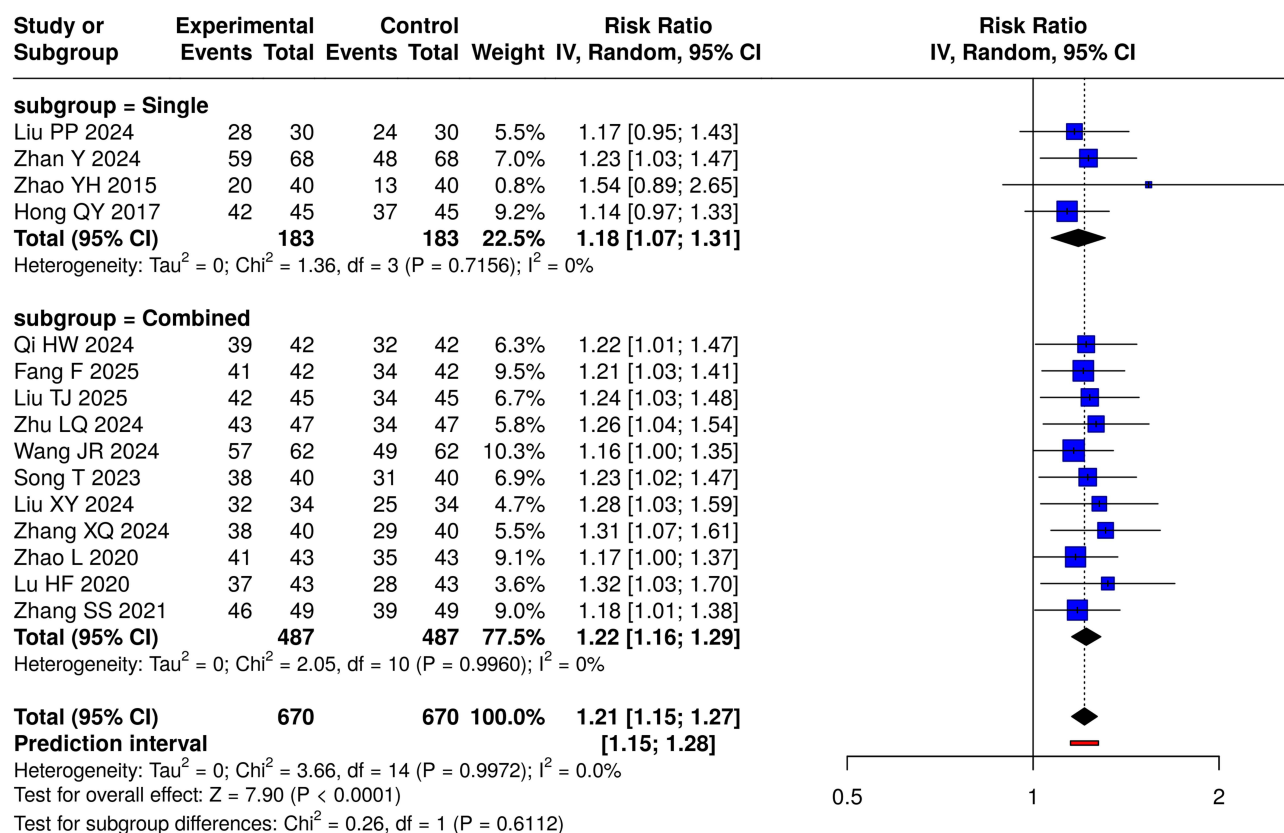


Figure 4 Meta-analysis of clinical effectiveness by treatment mode. Forest plot comparing acupuncture alone versus combined therapy (eg, traction, shockwave, bloodletting-cupping). RRs with 95% CIs are shown. Squares represent individual studies and diamonds indicate pooled estimates. The vertical solid line denotes no treatment effect (RR = 1). Bold values indicate pooled results. Both groups demonstrated improved clinical effectiveness without significant differences between treatment modes.

limitations and heterogeneity across the included randomized controlled trials. Both outcomes were considered critical for clinical decision-making.

Publication Bias Assessment Suggested Stable and Reliable Results

The funnel plot demonstrated an overall symmetrical distribution with only mild right-sided deviation (Figure 7), indicating minimal risk of small-study effects. The primary findings are therefore unlikely to be materially influenced by publication bias.

Discussion

This systematic review synthesizes current evidence regarding the use of Governor Vessel-related acupuncture therapies for acute-stage LDH and demonstrates overall favorable therapeutic outcomes across major clinical outcomes, including overall effectiveness and pain reduction.³⁸⁻⁴⁰ The meta-analysis revealed that these techniques significantly improved clinical efficacy and produced moderate-to-large effect sizes in pain relief, with remarkably consistent results across different Governor Vessel-based acupuncture systems.^{41,42} This suggests that whether the therapeutic rationale emphasizes warming and activating the Yang meridians, regulating the spine and paraspinal muscles, or tonifying the kidney and promoting blood circulation, these modalities may converge on similar therapeutic pathways targeting the spinal axis, periarticular tissues, and myofascial tension modulation.^{3,40}

The stable analgesic effect observed in this review carries substantial clinical implications. Patients with acute LDH typically experience a combination of nerve root inflammation, protective paraspinal muscle spasm, and mechanical compression. Although NSAIDs remain the standard first-line therapy, their clinical utility is often limited by gastrointestinal or cardiovascular intolerance, and some patients respond inadequately. By stimulating Governor Vessel-related

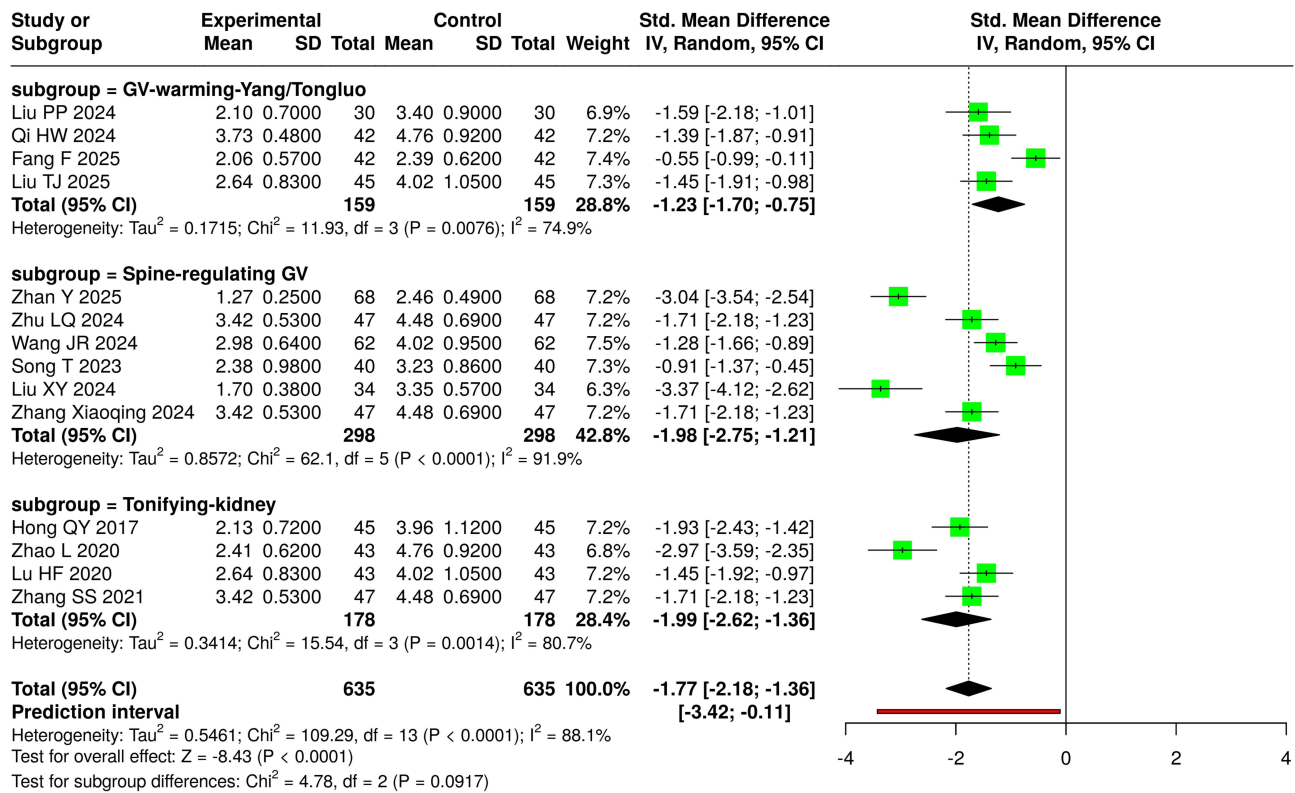


Figure 5 Meta-analysis of pain intensity (VAS). Forest plot presenting standardized mean differences in VAS reduction between acupuncture and control groups. Tongdu-related acupuncture produced significant pain alleviation across included studies. Squares represent individual study effect sizes and horizontal lines indicate 95% CIs. Diamonds represent pooled estimates. The vertical solid line indicates no effect (SMD = 0). Negative values indicate pain reduction in the acupuncture group. Bold values indicate pooled results. Prediction interval is shown in red.

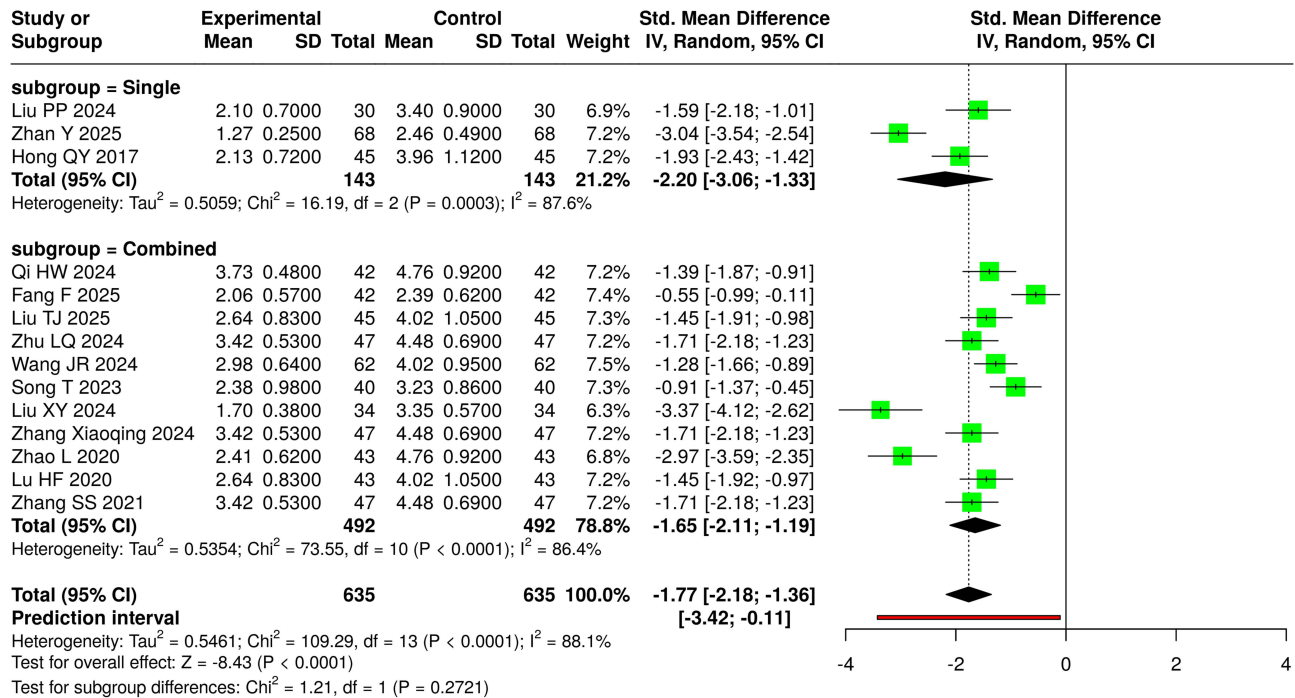


Figure 6 Subgroup meta-analysis of VAS reduction. Forest plot showing VAS improvement across three acupuncture paradigms: GV-warming–Yang/Tongluo, spine-regulating GV, and tonifying-kidney approaches. SMDs with CIs are shown. Squares represent individual studies and diamonds indicate pooled subgroup estimates. The vertical solid line represents no effect (SMD = 0). Negative values indicate pain reduction. Bold values indicate pooled results. All subtypes yielded significant pain reduction with no significant subgroup differences.

Table 2 GRADE Summary of Findings for Governor Vessel–Based Acupuncture in Lumbar Disc Herniation

Certainty Assessment							No. of Patients		Effect		Certainty	Importance
No. of Studies	Study Design	Risk of Bias	Inconsistency	Indirectness	Imprecision	Other Considerations	Governor Vessel–Based Acupuncture	Interventions	Relative (95% CI)	Absolute (95% CI)		
Overall clinical effectiveness												
15	Randomized trials	Not serious	Not serious	Not serious	Not serious	None	670	670	RR 1.21 (1.15 to 1.27)	–	LOW ⊗ ⊗ ○ ○	CRITICAL
Pain intensity measured by VAS												
14	Randomized trials	Not serious	Not serious	Not serious	Not serious	None	635	635	–	SMD –1.77 SD (–2.18 to –1.36)	LOW ⊗ ⊗ ○ ○	CRITICAL

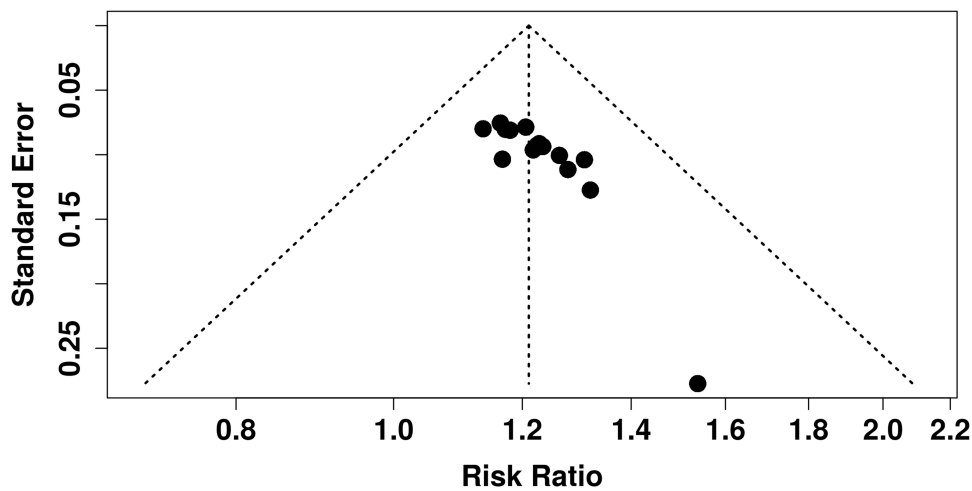


Figure 7 Funnel plot for publication bias assessment. Funnel plot evaluating small-study effects for clinical effectiveness outcomes. The distribution was generally symmetrical, suggesting minimal publication bias.

acupoints along the midline and paraspinal regions, acupuncture may exert dual mechanisms: regulating deep stabilizing muscles such as the multifidus to reduce mechanical irritation around the nerve root and modulating segmental neural activity to enhance endogenous analgesic signaling (eg, β -endorphin release), thereby reducing central sensitization.^{43,44} These multimodal actions align well with contemporary pain management strategies, making Governor Vessel acupuncture a potentially valuable intervention during the acute symptomatic phase.⁴⁵

The therapeutic consistency observed across different acupuncture systems suggests that Governor Vessel-based interventions possess a relatively “platform-like” efficacy mechanism. Despite theoretical distinctions, most techniques focus on the lumbar Governor Vessel pathway and adjacent paraspinal structures, producing overlapping biomechanical and neuroregulatory effects.^{39,42,45} Clinically, this means that practitioners may select among these acupuncture systems according to patient constitution, pain characteristics, and operational feasibility without concern for major differences in treatment effectiveness.^{42,46}

Although combined interventions, such as acupuncture with traction, bloodletting, shockwave therapy, or manual therapies showed slightly stronger effect sizes, subgroup comparisons did not demonstrate statistically significant differences.⁴⁷ This indicates that Governor Vessel acupuncture alone provides substantial therapeutic value, while combination strategies may enhance patient experience or provide complementary mechanisms rather than representing the primary driver of treatment efficacy.⁴⁸ For acute LDH, such flexibility allows individualized integration of multimodal therapies within a safe and controllable therapeutic framework.⁴⁹

Nevertheless, the therapeutic efficacy of acupuncture remains a subject of ongoing debate. Several high-quality randomized controlled trials and systematic reviews in musculoskeletal pain have reported that the benefits of acupuncture may not consistently exceed those of sham acupuncture, suggesting that observed effects may partly reflect placebo responses, contextual healing factors, or nonspecific neurophysiological stimulation.^{50–52} These findings highlight the potential contribution of expectancy, patient and practitioner interaction, and treatment ritual to clinical outcomes.⁵³ Accordingly, although our meta-analysis demonstrates favorable outcomes associated with Governor Vessel-based acupuncture, these results should be interpreted with caution, as limited blinding, heterogeneous control conditions, and variable methodological rigor across trials may have influenced effect estimates.

Overall, the present findings support the consideration of Governor Vessel acupuncture as an important treatment option for acute LDH, especially for patients seeking rapid pain relief while minimizing medication exposure.⁴⁰ Acupuncture provides a repeatable, relatively low-risk intervention that does not disrupt daily activity and adds a valuable modality to multidisciplinary pain management.³ Despite the robustness of the pooled results, several limitations must be acknowledged. First, the relatively small number of trials using single-modality Governor Vessel-based acupuncture limited the precision of comparisons between independent and combined strategies. Reporting

randomization and blinding procedures was generally insufficient, raising concerns regarding potential methodological bias.^{39,54} Follow-up durations in most studies were short, preventing conclusions on long-term outcomes or recurrence rates.⁴⁸ Moreover, procedural heterogeneity—such as variations in needle retention time, stimulation intensity, and treatment frequency likely contributed to residual heterogeneity in the quantitative synthesis.⁵⁵ Future research should prioritize rigorously designed multicenter randomized trials with appropriate sham controls and standardized intervention protocols to further clarify the specific versus nonspecific effects of Governor Vessel acupuncture, to identify optimized treatment strategies for different patient subgroups.

Conclusion

This systematic review and meta-analysis suggest that Governor Vessel-based acupuncture is associated with significant short-term improvements in pain and overall clinical effectiveness in acute lumbar disc herniation. Consistent benefits were observed across different Governor Vessel-related paradigms, supporting the clinical relevance of targeting the spinal midline and paraspinal axis. By integrating current randomized evidence, this study provides a structured synthesis supporting the role of Governor Vessel-based acupuncture as a potential nonpharmacological option within contemporary pain management for acute LDH. However, well-designed, sham-controlled, multicenter trials are required to confirm specific efficacy, clarify mechanisms, and determine long-term outcomes.

Data Sharing Statement

All data supporting the findings of this study are included within the article and its [supplementary materials](#). No new data was generated. Extracted data and analytical methods are available from the corresponding author upon reasonable request.

Ethics Approval and Informed Consent

Ethical approval and informed consent were not required for this study. The study did not involve any new experiments on human participants or animals, nor did it include the collection of individual-level patient data. All included studies were conducted in accordance with their respective institutional ethical standards.

Consent for Publication

Not applicable. This manuscript does not contain any individual person's data, images, videos, recordings, or other potentially identifiable information. Therefore, consent for publication was not required.

Acknowledgments

Shuai Yang and Qngfeng Guo are co-first authors for this study. The authors would like to thank all investigators and participants of the original studies included in this meta-analysis.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

Disclosure

The authors declare that they have no known competing financial or non-financial interests that could have appeared to influence the work reported in this paper.

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