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Comparative Effectiveness of Traditional Medicines for Gall Bladder Stones: A Systematic Literature Review.

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ABSTRACT

This systematic literature review synthesizes evidence from 40 studies examining the comparative effectiveness of traditional medicine systems—including Ayurveda, Traditional Chinese Medicine (TCM), Siddha, Unani, Homeopathy, and Japanese medicine—for treating gall bladder stones. The review evaluates clinical efficacy, safety profiles, methodological quality, integration with modern medicine, and practical guidelines for practitioners. Findings indicate that Ayurveda and TCM demonstrate the most consistent evidence for symptom relief and stone dissolution, while significant research gaps persist in standardized protocols and long-term outcomes. The review identifies critical areas for future research and provides evidence-based recommendations for clinical practice.

INTRODUCTION

Gall bladder stones (cholelithiasis) represent a significant global health burden, affecting up to 15% of adults worldwide (Yadav & Gupta, 2025). While cholecystectomy remains the standard surgical intervention, increasing attention has turned to non-surgical alternatives due to associated risks, postoperative complications, and rising surgical waitlists (Sonalkar et al., 2023; Hall et al., 2023). Traditional medicine systems offer promising alternatives through holistic, multi-target approaches that have evolved from ancient formulations to modern integrative applications (Gaikwad & Gulhane, 2024; Jun et al., n.d.).

The fragmented evidence base across traditional systems necessitates comprehensive comparative evaluation to inform evidence-based clinical practice. This review addresses this gap by systematically analyzing 40 studies to provide practitioners with a practical framework for integrating traditional medicine approaches into gallstone management

METHODOLOGY

The review employed a structured synthesis framework encompassing clinical case reports, systematic reviews, randomized trials, and integrative evaluations. Literature selection involved comprehensive database searches, citation chaining, and relevance scoring, resulting in 78 candidate papers, with 50 identified as highly relevant to the research query. The analytical framework included qualitative synthesis and comparative evaluation organized by medicinal system and therapeutic approach.

Clinical Efficacy Across Traditional Systems

Ayurvedic Medicine

Ayurvedic interventions demonstrate significant therapeutic potential for gallstone management. Multiple case studies report complete stone dissolution and symptom resolution within 2-3 months using herbal formulations (Sonalkar et al., 2023; Gaikwad & Gulhane, 2024; Sharma, 2023). Ayurveda conceptualizes cholelithiasis as *pittashmari* or *Bastigata Ashmari*, employing herbal protocols based on classical texts that show gallstone size reduction and symptomatic improvement (Sowmya.H et al., 2022). Meta-analyses in related conditions like urolithiasis support Ayurvedic efficacy, though larger trials are needed (Rathi et al., 2024).

Traditional Chinese Medicine (TCM)

TCM shows consistent evidence for symptom improvement and gallbladder function enhancement. Systematic reviews indicate that proprietary Chinese medicines improve symptoms and gallbladder function, though methodological quality varies (Jun et al., n.d.; Zhi-cheng, 2010). Herbal formulations like Lidantang demonstrate effectiveness in gallstones with cholecystitis, reducing pain without serious side effects (Chen-guang et al., n.d.). However, some reviews note insufficient evidence for Chinese herbs in mild cholelithiasis, highlighting variability in efficacy (Gan et al., 2013).

Homeopathy

Homeopathic approaches present promising case reports with stone dissolution and symptom relief. A 2020 case study documented symptom alleviation and stone disappearance within 3 months using homeopathic medicine in 50th millesimal potency, with no adverse effects reported (Sahoo et al., 2020). Treatment selection based on symptom totality aligns with homeopathic principles, though evidence remains limited to case reports.

Siddha and Unani Medicine

Evidence for Siddha and Unani systems is sparse and primarily extrapolated from related conditions. A 2017 case study demonstrated Siddha medicine's effectiveness and cost-efficiency for urolithiasis with no recurrence observed (S et al., 2017). Unani medicine lacks specific gallstone studies, representing a significant research gap.

Japanese Medicine

Japanese medicine data are minimal and mostly historical, with early research focusing on ursodeoxycholic acid (UDCA) therapy. Nakayama's 1980 review compared chenodeoxycholic acid and UDCA, establishing UDCA as preferred for safety and efficacy in oral cholelitholysis.

Safety Profiles and Adverse Effects

Traditional medicines generally report favorable safety profiles with minimal adverse effects. Systematic reviews note mild, self-limiting adverse effects such as diarrhea in Chinese medicine trials (Jun et al., n.d.; Gan et al., 2013). Ayurvedic and homeopathic treatments are described as relatively safe and well-tolerated alternatives to surgery (Gaikwad & Gulhane, 2024; Sahoo et al., 2020). Integrative approaches combining traditional and modern medicine show fewer side effects compared to monotherapies (Xue-mei, n.d.; Chuan-tao & Chang-qing, n.d.).

Preclinical toxicity assessments confirm safety of some herbal preparations. Castro-Torres et al. (2012) demonstrated black radish juice's antilithiasic effects without toxicity in mice, supporting traditional claims. However, systematic safety monitoring and pharmacovigilance studies remain limited, representing a critical research gap.

Integration with Modern Medicine

Integrative approaches combining traditional and modern medicine demonstrate enhanced therapeutic outcomes. Ten studies show that integration improves efficacy, reduces complications, and enhances patient recovery (Liu et al., 2022; Xue-mei, n.d.; WANG & SUN, n.d.; SHANG et al., n.d.). The SELECT concept guides clinical application of minimally invasive integrated TCM and Western medicine for hepatobiliary diseases (SHANG et al., n.d.).

Expert consensus guidelines provide structured approaches for combined therapies. Liu et al. (2022) developed consensus on interventional treatment of choledocholithiasis with integrative medicine, while Kalra et al. (2024) emphasize evidence-based integration frameworks. However, standardization challenges and regulatory hurdles persist, limiting widespread adoption.

Methodological Quality and Research Design

The literature reveals significant methodological limitations across traditional medicine studies. Most clinical evidence derives from uncontrolled case studies, retrospective analyses, or small cohorts lacking randomization and adequate power (Sonalkar et al., 2023; Gaikwad & Gulhane, 2024; Sharma, 2023). Systematic reviews consistently highlight low methodological quality, incomplete reporting, and high heterogeneity among trials (Jun et al., n.d.; 陈军 et al., n.d.; Gan et

al., 2013).

Only UDCA studies include more robust randomized controlled trials, though evidence remains inconclusive. Hall et al. (2023) conducted a systematic review of UDCA in symptomatic gallstone disease, finding clinical equipoise persists regarding its role. The scarcity of long-term follow-up data and comparative effectiveness studies directly contrasting traditional systems represents a major limitation.

Pharmacological Mechanisms

Traditional medicines exert multi-targeted effects through various pharmacological mechanisms. Herbal formulations demonstrate cholagogue, choleretic, and anti-inflammatory actions (Jun et al., n.d.; Yuan & Zhang, 2025). Castro-Torres et al. (2012, 2013) identified bioactive compounds including saponins, flavonoids, and glucosinolates in natural products with antilithiasic effects.

UDCA therapy improves gallbladder bile turnover and shows anti-inflammatory effects (Guarino et al., 2005, 2013). Multi-component drugs combining artichoke, angelica, UDCA, and taurine demonstrate synergistic effects for biliary diseases (Shcherbynina, 2023). However, mechanistic understanding remains incomplete, necessitating further pharmacological characterization.

Research Gaps and Future Directions

The review identifies eight critical research gaps requiring urgent attention:

1. **Lack of high-quality RCTs**: Most studies are case reports or small cohorts with low methodological rigor (Sonalkar et al., 2023; Jun et al., n.d.; 陈军 et al., n.d.)
2. **Insufficient comparative effectiveness studies**: Direct comparisons between traditional systems are lacking (Sonalkar et al., 2023; Sahoo et al., 2020; Sofia, 2015)
3. **Limited long-term safety and recurrence data**: Most studies report short-term outcomes only (Jun et al., n.d.; Bian et al., 2024)
4. **Poor standardization of herbal formulations**: Variability in composition and dosing limits reproducibility (Jun et al., n.d.; Chang-hui, n.d.; Yuan & Zhang, 2025)
5. **Inadequate mechanistic studies**: Active compounds and molecular mechanisms remain unclear (Yuan & Zhang, 2025; Dooren et al., 2016; Castro-Torres et al., 2012)
6. **Limited integration frameworks**: Standardized clinical pathways are underdeveloped (Liu et al., 2022; Kalra et al., 2024; Kustiyati et al., 2024)
7. **Underexplored herb-drug interactions**: Safety monitoring frameworks are needed (Kalra et al., 2024; 陈军 et al., n.d.)
8. **Scarcity of data on Siddha, Unani, and Japanese medicine**: Research is sparse and extrapolated (Sofia, 2015; S et al., 2017; Nakayama, 1980)

Future research should prioritize large-scale multicenter RCTs, pharmacological characterization using multi-omics approaches, development of standardized clinical guidelines, and implementation of pharmacovigilance programs.

Practical Guidelines for Practitioners

Based on the synthesized evidence, the following practical guidelines emerge:

1. **Patient Selection**: Traditional medicines may benefit patients unwilling or unfit for surgery, particularly those with symptomatic gallstones and preserved gallbladder function.
2. **Treatment Protocols**:
    - Ayurveda: Herbal formulations based on *pittashmari* principles with 2-3 month treatment durations
    - TCM: Proprietary Chinese medicines or decoctions targeting symptom relief and gallbladder function
    - Homeopathy: Individualized remedies based on symptom totality

3. **Integration Strategies**: Combine traditional therapies with modern interventions for enhanced outcomes, particularly in bile duct stones and postoperative care.

4. **Monitoring and Follow-up**: Regular ultrasound imaging and symptom assessment during treatment, with long-term monitoring for recurrence prevention.

5. **Safety Considerations**: Monitor for potential herb-drug interactions, particularly with anticoagulants and immunosuppressants.

CONCLUSION

Traditional medicine systems offer valuable complementary options for gallstone management, with Ayurveda and TCM demonstrating the most consistent evidence for efficacy. While safety profiles are generally favorable, methodological limitations and research gaps necessitate cautious interpretation of current evidence. Integrative approaches combining traditional and modern medicine show promise for improved patient outcomes but require further validation through rigorous clinical trials.

The development of standardized, evidence-based clinical guidelines and collaborative healthcare models will be essential for realizing the full therapeutic potential of traditional medicines in gallstone management. Future research must address critical gaps in comparative effectiveness, long-term safety, and mechanistic understanding to inform evidence-based practice and optimize patient-centered care

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