

Ayurvedic Management of Recurrent Tonsillitis (Tundikeri) in Children: A Classical Review with Rasayana and Preventive Correlates

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Abstract: Background: Tundikeri — the classical Ayurvedic designation for palatine tonsil inflammation — corresponds to contemporary recurrent tonsillitis, a chronic upper respiratory condition that disproportionately affects school-age children aged 6–12 years.^[1,2] Conventional interventions such as repeated antibiotic courses and surgical tonsillectomy fail to address the constitutional immune deficits perpetuating recurrence.^[8] Ayurveda offers a systematic Rasayana and preventive framework targeting Ojakshaya (immune depletion) and Agnimandya (mucosal immune impairment) as the root causes of recurrent episodes.^[1,3]

Objectives: To systematically compile classical Ayurvedic textual evidence on Tundikeri management with emphasis on Rasayana and preventive strategies for children aged 6–12 years, and to establish correlations with contemporary immunological and pharmacological science.

Materials and Methods: Primary classical Ayurvedic texts — Charaka Samhita, Sushruta Samhita, Ashtanga Hridayam, Kashyapa Samhita, Madhava Nidana, Yogaratnakara, and Sharangadhara Samhita — were reviewed for references to Tundikeri, Kantha Roga, Rasayana Chikitsa, and Bala Rasayana.^[1–7] Relevant Shlokas were transliterated, translated, and interpreted using frameworks of pediatric immunology, ENT pathology, and pharmacology.

Results: Classical texts classify Tundikeri as a Kapha-Pittaja Vyadhi.^[2,5] Recurrence is attributed to Ojakshaya, Agnimandya, and Srotodushti.^[1,3] Rasayana formulations — Chyavanprasha, Guduchi, Pippali, Ashwagandha, Brahmi, and Triphala — show documented immunomodulatory, anti-biofilm, and mucosal-regenerative properties.^[9–13] Local measures including Gandusa, Kavala, and Nasya reduce tonsillar pathogen burden and enhance mucosal IgA secretion.^[3,6]

Conclusion: Ayurvedic Rasayana and preventive management provide a safe, multi-target, root-cause-directed alternative to repeated antibiotic therapy for recurrent tonsillitis in children. Systematic clinical trials evaluating immune biomarkers and recurrence frequency are warranted.

Keywords: Tundikeri, Recurrent Tonsillitis, Rasayana Chikitsa, Kaumarabhritya, Ojakshaya, Immunomodulation, Bala Rasayana

I. INTRODUCTION

Recurrent tonsillitis is formally defined by the Paradise criteria as seven or more acute episodes per year, five per year for two consecutive years, or three per year for three consecutive years, and ranks among the most prevalent chronic upper respiratory conditions encountered in pediatric clinical practice.^[8] School-age

children between 6 and 12 years bear the greatest disease burden, owing to intensified peer-to-peer pathogen exposure, ongoing immunological maturation, and dietary habits that promote Kapha accumulation.^[1,4] Contemporary management through repeated antibiotic prescriptions and eventual tonsillectomy effectively suppresses acute episodes but does not address the underlying immunological terrain that sustains recurrence, and is increasingly associated with antimicrobial resistance and surgical morbidity.^[8]

Ayurveda's Kaumarabhritya (pediatric medicine) addresses this therapeutic gap through Rasayana — a systematic programme of immune-restorative herbs and formulations designed to correct Ojakshaya (depletion of innate immune reserves), Agnimandya (impairment of mucosal digestive immunity), and Srotodushti (obstruction of physiological channels), which classical literature identifies as the three biological substrates perpetuating the cycle of tonsillitis recurrence.^[1,3,4] The present review systematically analyzes classical Ayurvedic textual evidence on Tundikeri management with a focused lens on Rasayana and preventive strategies for the 6–12-year age group, and correlates classical therapeutic reasoning with contemporary immunopharmacological evidence.

II. MATERIALS AND METHODS

This study constitutes a systematic classical literature review. The following eight primary Ayurvedic texts were examined for references to Tundikeri, Kantha Roga, Rasayana Chikitsa, and Bala Rasayana: Charaka Samhita (Sutra Sthana and Chikitsa Sthana);^[3] Sushruta Samhita (Nidana Sthana and Chikitsa Sthana);^[2] Ashtanga Hridayam (Uttara Tantra);^[3] Kashyapa Samhita (Sutra Sthana and Khilasthana);^[4] Madhava Nidana;^[5] Yogaratnakara;^[6] Sharangadhara Samhita;^[7] and Ashtanga Sangraha. Pertinent Shlokas were identified, transliterated into Roman script, translated into English, and critically interpreted using contemporary frameworks of immunology, otorhinolaryngology, and pediatric pharmacology.^[9–15]

III. TUNDIKERI — CLASSICAL DESCRIPTION AND BIOMEDICAL CORRELATION

The anatomical term 'Tundika' is documented in Sushruta Samhita (Nidana Sthana, Chapter 16) within the classification of Sapta Jihvamula Granthi — seven bilateral glandular lymphoid structures of the oropharynx.^[2] These Tundika structures correspond to the palatine tonsils forming the anterior pillars of Waldeyer's lymphoid ring, which serve as the primary mucosal immunological sentinels of the upper respiratory tract.^[2,5] Classical etiological factors (Nidana) for Tundikeri include: habitual intake of Ruksha-Sheeta-Guru Ahara (cold, heavy, rough dietary articles) provoking Kapha Vriddhi and Ama formation;^[1,3] Ati-Sheeta Jala Pana (excess cold-water consumption) disrupting oropharyngeal mucociliary function and local sIgA secretion;^[3] Pradushta Vata Sevana (exposure to polluted air) triggering mucosal inflammatory cascades;^[1] and Krimi (microbial colonisation) — corresponding biomedically to Group A beta-haemolytic Streptococcus (GABHS), Staphylococcus aureus, Haemophilus influenzae, and respiratory viruses.^[5,8]

The resulting Dosha disturbance — principally Kapha Vriddhi compounded by Pitta Prakopa — acts upon the Tundika to generate Shotha (inflammatory swelling) and Rakta Dushti (vitiating of blood tissue).^[2,3] Translating this into contemporary pathophysiology: Kapha Vriddhi equates to tonsillar crypt biofilm accumulation and mucus retention; Pitta Prakopa corresponds to the pro-inflammatory cytokine cascade (IL-1 β , TNF- α , IL-6) underpinning fever and erythema; and Rakta Dushti manifests as tonsillar hyperaemia and peritonsillar oedema.^[5,13] The propensity for recurrence is classically explained through persistent Ama within tonsillar crypts, progressive Ojakshaya depleting immune surveillance, and chronic Agnimandya perpetuating incomplete pathogen clearance.^[1,3,4]

Table 1: Classical Lakshana of Tundikeri and Their Contemporary Clinical Equivalents

Classical Lakshana	Ayurvedic Significance	Modern Clinical Equivalent
Shotha	Kapha-Pitta-mediated local swelling of Tundika	Tonsillar enlargement Grade I–IV; oropharyngeal erythema
Ruja	Pitta-generated Daha (burning)	Odynophagia; sore throat; referred otalgia in some cases

Classical Lakshana	Ayurvedic Significance	Modern Clinical Equivalent
	and Vedana (pain)	
Jwara	Systemic Ama-Pitta spread via Rakta Dushti	Pyrexia 38–40°C; tachycardia; systemic inflammatory response
Kanthavarodha	Kapha-Ama blockage of upper respiratory passage	Tonsillar hypertrophy causing airway narrowing; sleep-disordered breathing
Durgandha Mukha	Ama retention in tonsillar crypts	Halitosis from cryptic debris and anaerobic biofilm colonisation
Svara Vikara	Pranavaha Srotas obstruction altering phonation	Muffled 'hot-potato' voice from peritonsillar involvement
Aruchi	Systemic Agnimandya reducing appetite and intake	Dysphagia-related anorexia; reduced oral intake

IV. RECURRENT TUNDIKERI — AYURVEDIC PATHOGENIC FRAMEWORK

Charaka Samhita (Sutra Sthana, Chapter 11) attributes disease recurrence to incomplete therapeutic resolution — failure to fully eradicate the underlying Dosha imbalance and Ama — resulting in Punarvega (recrudescence episodes) with progressively diminished host resistance.^[1] Three interrelated classical mechanisms specifically perpetuate Tundikeri recurrence:

Ojakshaya — Depletion of Innate Immune Reserves: Each successive episode of tonsillar infection depletes Ojas — the finest product of tissue metabolism and the classical substrate of immune vitality.^[1,4] Contemporary immunology confirms this observation: children with recurrent tonsillitis demonstrate measurably lower mucosal sIgA concentrations, reduced NK cell cytolytic activity, and exhausted tonsillar T-lymphocyte pools relative to healthy age-matched controls.^[9,10] Classical Rasayana therapy is specifically directed at reversing this immune depletion.^[13]

Chronic Agnimandya — Impaired Mucosal Digestive Immunity: Kashyapa Samhita (Sutra Sthana, Chapter 5) equates Agni not only with gastric digestion but with immunological processing of foreign antigens at mucosal barriers.^[4] Chronically weakened Agni perpetuates Ama production and prevents complete cryptic debris clearance between episodes —^[1,4] correlating in modern terms with persistent tonsillar biofilm formation providing a substrate for recurrent pathogen colonisation.^[8,13]

Srotodushti — Obstruction of Respiratory Physiological Channels: Kapha-Ama accumulation within the Pranavaha Srotas impairs the mucociliary escalator, reduces airflow-dependent pathogen clearance, and sustains the humid microenvironment that tonsillar pathogens exploit for persistent colonisation.^[1,3] This classical concept aligns directly with contemporary evidence on mucociliary dysfunction and biofilm persistence in recurrent oropharyngeal infection.^[8]

Children aged 6–12 years are uniquely predisposed to this recurrence cycle: collective school settings amplify pathogen exposure exponentially;^[8] Kapha-promoting dietary preferences (cold beverages, sweets, fried snacks) are prevalent in this age group;^[1,4] mucosal sIgA continues maturing through mid-childhood, leaving a window of relative vulnerability;^[9] and academic and social stressors activate cortisol-mediated HPA axis responses that measurably suppress NK cell activity and T-lymphocyte function — a phenomenon acknowledged in Kashyapa Samhita (Sutra Sthana, Chapter 1) through the concept of Manasika Nidana.^[4,12]

V. RASAYANA CHIKITSA — CLASSICAL FRAMEWORK AND PHARMACOLOGICAL BASIS

Rasayana is defined across classical Ayurvedic texts as the systematic means of attaining optimal quality of all seven Dhatus (body tissues) and establishing Vyadhikshamatva — the host's capacity to resist both disease initiation (Vyadhi-bala-virodha) and disease propagation (Vyadhi-utpada-bala-virodha).^[1,13] These two dimensions correspond precisely to modern innate and adaptive immunocompetence, positioning Rasayana therapy as a scientifically coherent immunological intervention in recurrent Tundikeri.^[13,15]

A. *Chyavanprasha Avaleha*

Described in Charaka Samhita (Chikitsa Sthana 1.1, verses 62–74), Chyavanprasha is universally recognised across classical lineages as the foremost pediatric Rasayana.^[3] Its principal constituent, Amalaki (*Emblica officinalis*), is among the most vitamin C-dense botanicals known — a property that directly supports neutrophil oxidative burst, interferon production, and collagen-dependent mucosal barrier integrity.^[14] Independent pharmacological studies confirm that Chyavanprasha elevates NK cell cytolytic activity, amplifies mucosal sIgA production, upregulates IFN- γ , and inhibits Streptococcal biofilm adhesion to oropharyngeal epithelium.^[9,13] Recommended dose for children aged 6–12 years: 5–10 g twice daily with warm milk.^[3]

B. *Guduchi — Tinospora cordifolia*

Referenced in Charaka Samhita (Sutra Sthana, Chapter 35) as a premier Tridoshahara Rasayana,^[3] Guduchi's immunological activity is primarily mediated through arabinogalactan polysaccharides that bind macrophage surface receptors to initiate phagocytic priming and controlled pro-inflammatory cytokine secretion.^[10] Concurrently, Guduchi alkaloids stimulate T-lymphocyte clonal expansion and demonstrate direct antimicrobial activity against GABHS strains.^[10] Its mild Anushna Veerya (neutral thermal potency) makes it well-tolerated in children without risk of Pitta aggravation.^[3] Recommended dose: 250–500 mg twice daily.

C. *Pippali — Piper longum*

Indicated in Charaka Samhita (Chikitsa Sthana 1.3) for Kapha-predominant upper respiratory conditions including Kasa and Shwasa,^[3] piperine — the principal alkaloid of Pippali — inhibits NF- κ B nuclear translocation, thereby attenuating the chronic tonsillar inflammatory cycle that perpetuates cryptic tissue damage.^[13] Piperine concurrently enhances macrophage phagocytic efficiency and demonstrates direct *in vitro* activity against Streptococcal strains.^[13] The classical Vardhamana (graduated incremental) protocol — commencing at 125 mg and escalating weekly toward 500 mg — optimises hepatic enzyme induction and bioavailability.^[3]

D. *Ashwagandha — Withania somnifera*

Documented in Kashyapa Samhita (Khilasthana) as the primary adaptogenic Rasayana for children with stress-related immune deterioration,^[4] Ashwagandha withanolides reduce hypothalamic-pituitary-adrenal (HPA) axis hyperactivation, normalise serum cortisol, facilitate Th1/Th2 immune rebalancing, and restore macrophage vigilance.^[9] This pharmacological profile maps precisely onto the school-age child with recurrent tonsillitis who exhibits elevated basal cortisol, diminished Th1 cytokine output, and impaired NK cell surveillance.^[9,12] Specifically sanctioned in classical texts for Bala-varadhana (constitutional strengthening) in children aged 6–14 years,^[4] recommended dose: 250–500 mg with warm milk at bedtime.

E. *Brahmi — Bacopa monnieri*

Brahmi functions as an important adjunct Rasayana for children in whom psychoneurological stress is a significant driver of immune suppression.^[11] Bacoside glycosides attenuate cortisol-mediated limbic system hyperstimulation at the HPA axis, reducing stress-induced immunosuppression, while concurrently supporting NK cell differentiation and activity.^[11] This dual neuroadaptogenic and immunomodulatory profile makes Brahmi a rational adjunct to Ashwagandha in the school-age child with academically associated recurrent infections.^[11,12] Recommended dose: 250–500 mg twice daily with warm milk.

F. *Triphala — Universal Channel-Purifying Rasayana*

Ashtanga Hridayam (Uttara Tantra, Chapter 39) designates Triphala as the singular formulation capable of simultaneously achieving Agni-deepana, Srotoshodhana, and broad-spectrum Rasayana activity^[3] — making it uniquely suited for recurrent Tundikeri where all three classical pathogenic substrates (Agnimandya, Srotodushti, and Ama accumulation) require concurrent correction.^[1,3] The combined tannin complex of Haritaki, Bibhitaki, and Amalaki confers documented anti-biofilm activity against oropharyngeal pathogens, supports tonsillar mucosal regeneration, and exerts broad antimicrobial effects.^[14] Yogaratnakara specifically records Triphala Churna combined with Madhu and Ghrita as a classical preventive formulation

for Kantha Roga.^[6]

Table 2: Rasayana Formulations — Classical References, Pharmacological Mechanisms, and Paediatric Dosages

Rasayana	Classical Reference	Key Pharmacological Activity	Paediatric Dose (6–12 yrs)
Chyavanprasha Avaleha (Amalaki)	Ch.Sa. Chikitsa 1.1 [3]	NK cell activation; sIgA upregulation; IFN- γ induction; anti-Streptococcal biofilm [9]	5–10 g twice daily with warm milk
Guduchi — <i>Tinospora cordifolia</i>	Ch.Sa. Sutra St. 35 [3]	Arabinogalactans: macrophage priming; T-cell proliferation; anti-GABHS [10]	250–500 mg twice daily
Pippali — Piper longum	Ch.Sa. Chikitsa 1.3 [3]	Piperine: NF- κ B inhibition; macrophage phagocytosis; anti-Streptococcal [13]	125 mg → 500 mg (Vardhamana protocol)
Ashwagandha — <i>Withania somnifera</i>	Kashyapa Sa. Khilasthana [4]	Withanolides: Th1/Th2 modulation; cortisol reduction; NK cell restoration [9]	250–500 mg at bedtime with warm milk
Brahmi — <i>Bacopa monnieri</i>	Classical Rasayana texts [14]	Bacosides: HPA-axis modulation; cortisol attenuation; NK cell support [11]	250–500 mg twice daily with milk
Triphala — three-fruit combination	A.H. Uttara Tantra 39; Yogaratnakara [3,6]	Tannins: anti-biofilm; mucosal regeneration; Agni-deepana; broad-spectrum antimicrobial [14]	With Madhu and Ghrita per Kantha Roga protocol

VI. LOCAL URDHVAJATRUGATA PREVENTIVE MEASURES

A. Gandusa and Kavala — Medicated Gargling

Ashtanga Hridayam (Sutra Sthana, Chapter 22) establishes Gandusa (retention of medicated liquid in the mouth) and Kavala (active oropharyngeal gargling) as essential daily preventive practices.^[3] Gargling with Triphala Kwatha mechanically dislodges tonsillar crypt debris and disrupts biofilm architecture, while polyphenolic tannins directly inhibit GABHS adhesion to tonsillar epithelium and stimulate local sIgA secretion.^[6,13,14] Substitution with Yashtimadhu Kwatha adds glycyrrhizin-mediated anti-inflammatory and mucosal-healing properties.^[14] Tila Taila used for Kavala has been shown to disrupt Streptococcal and Staphylococcal cell membranes through saponification of surface fatty acids, delivering anti-biofilm activity through a distinct mechanism.^[3,6] These measures achieve high local concentrations of bioactive compounds at tonsillar tissue while bypassing systemic first-pass metabolism — a pharmacokinetic advantage parallel to modern topical mucosal immunotherapy.^[13]

B. Nasya — Daily Nasal Oil Instillation

Pratimarsha Nasya, described in Ashtanga Hridayam (Sutra Sthana, Chapter 20), involves daily instillation of 1–2 drops of Anu Taila per nostril.^[3] This procedure concurrently lubricates and reinforces the nasal mucosal lining against pathogen adhesion; enhances the mechanical efficiency of the mucociliary escalator; reduces the volume of postnasal secretions dripping onto tonsillar surfaces, limiting pathogen seeding from the nasal cavity; and delivers sesame-lipid-associated bioactive terpenoids directly to Waldeyer's ring lymphoid tissue to modulate local immune surveillance.^[3,6] The procedure is well-tolerated by children aged 6–12 years and can be incorporated as a morning hygiene routine without significant inconvenience.^[4]

C. Dhumapana — Medicated Steam Inhalation

Charaka Samhita (Sutra Sthana, Chapter 5) describes Dhumapana as a therapeutic inhalation practice

with direct application to upper respiratory conditions.^[1] Steam inhalation incorporating Haridra (*Curcuma longa*), Vacha (*Acorus calamus*), and Nimba (*Azadirachta indica*) delivers bioactive volatile compounds — primarily curcumin, β -asarone, and nimbidin — directly to tonsillar mucosal surfaces via the inhaled vapour phase.^[14] Curcumin independently inhibits NF- κ B-mediated pro-inflammatory transcription, suppresses GABHS biofilm establishment, and enhances macrophage oxidative burst activity^[13,14] — providing multi-mechanism scientific justification for this classical preventive practice. Practical administration: 5–10 minutes twice daily, particularly at seasonal transitions.^[1]

VII. PATHYA-APATHYA GUIDELINES FOR CHILDREN AGED 6–12 YEARS

Ayurvedic management recognises that pharmacological prescriptions cannot succeed in isolation from the child's daily dietary and behavioural environment.^[1,4] Pathya-Apathya guidelines function as a structured behavioural immunology framework — modifying dietary and lifestyle variables that either reinforce or erode the mucosal immune competence established by Rasayana therapy.^[3,6] The following guidelines are compiled from Kashyapa Samhita, Charaka Samhita, and Yogaratnakara with specific relevance to children in the 6–12-year age group:^[1,4,6]

Table 3: Pathya-Apathya Guidelines for Children with Recurrent Tundikeri (6–12 Years)

Domain	Pathya — Recommended	Apathya — To Avoid
Diet	Warm freshly cooked meals; Mudga (green gram) soup; Yava (barley) preparations; Saindhava Lavana in warm water; Tulsi-Shunti decoction; Haridra in warm milk	Cold beverages and ice cream; curd at night; excess sweets and fried food; packaged and ultra-processed snacks; cold dairy products
Lifestyle	Age-appropriate physical exercise (Vyayama); 8–10 hours sound sleep; morning sunlight; steam inhalation at seasonal transitions; regular medicated oral rinsing	Cold showers; prolonged damp/cold exposure; daytime sleep (Divaswapna); sedentary screen time; mouth breathing; neglect of oral hygiene
Seasonal Regimen	Winter (Hemanta/Shishira): warming Rasayana; Spring (Vasanta): mild Shodhana or Vamana; Monsoon (Varsha): Agni-deepana with Trikatu	Disregarding seasonal dietary transitions; unprotected rain and cold-wind exposure; irregular meal schedules during seasonal change

VIII. DISCUSSION

The central contribution of this review is demonstrating that classical Ayurvedic literature provides not merely an empirical list of herbal remedies for throat infections, but a mechanistically coherent, root-cause-directed immunological framework for recurrent tonsillitis that anticipates several foundational discoveries of twentieth-century mucosal immunology.^[13,15] The classical identification of Ojakshaya and Agnimandya — rather than individual microbial encounters — as the primary substrates of recurrence^[1,3] presages the modern immunological finding that children with recurrent tonsillitis demonstrate quantifiably lower mucosal sIgA concentrations, impaired tonsillar lymphocyte proliferative responses, and dysregulated Th1/Th2 cytokine balance relative to healthy controls.^[9,10] Both the classical and modern frameworks converge on the same therapeutic conclusion: the primary target is the immune competence of the host, not merely the individual microbial agent.^[13,15]

The six Rasayana formulations reviewed operate through complementary pharmacological mechanisms that collectively address each classical substrate of recurrence. Chyavanprasha rebuilds first-line mucosal defence by restoring sIgA and NK cell activity;^[9,13] Guduchi arabinogalactans prime macrophages to actively dismantle established tonsillar biofilm;^[10] Ashwagandha withanolides counteract the cortisol-driven immunosuppression that renders school-age children chronically susceptible;^[9,12] Pippali piperine interrupts NF- κ B-driven chronic tonsillar inflammation;^[13] Brahmi bacosides reinforce neuro-immune axis modulation;^[11] and Triphala tannins simultaneously clear tonsillar crypts, regenerate mucosa, and restore Agni^[14] — addressing all three classical pathogenic mechanisms in a single formulation.^[1,3]

Local Urdhvajatrugata measures — Gandusa, Kavala, and Nasya — deliver bioactive compounds directly to tonsillar tissue at concentrations orders of magnitude higher than those achievable by systemic oral routes, bypassing hepatic first-pass metabolism.^[3,6] This pharmacokinetic advantage parallels modern topical mucosal immunotherapy and positions these classical measures as genuinely sophisticated targeted interventions.^[13] The Pathya-Apathya guidelines align with emerging nutritional immunology evidence confirming that high-glycaemic, high-fat dietary patterns suppress neutrophil function and mucosal barrier integrity,^[15] while Amalaki, Haridra, and Tulsi individually enhance innate immunity through vitamin C-mediated neutrophil augmentation, curcumin cytokine modulation, and ursolic acid NK cell activation respectively.^[9,13,14] The Ritucharya (seasonal regimen) — targeting Shodhana in Vasanta for Kapha-Ama clearance and Agni-deepana in Varsha for monsoon-season immune reinforcement^[1,3] — finds partial support in epidemiological data on seasonal variation in tonsillitis incidence.^[8]

IX. CONCLUSION

The present review establishes that Ayurvedic Kaumarabhritya offers a scientifically coherent, multi-mechanism therapeutic strategy for recurrent Tundikeri in children aged 6–12 years that is both complementary to and conceptually distinct from contemporary ENT management.^[1,8] By targeting Ojakshaya, Agnimandya, Ama accumulation (tonsillar biofilm), and Srotodushti — the four classical substrates of recurrence^[1,3,4] — Ayurvedic therapy addresses the biological conditions sustaining the cycle of reinfection rather than suppressing individual episodes.^[13,15] The convergence between classical therapeutic reasoning and contemporary immunopharmacological evidence across six Rasayana formulations, three local preventive measures, and a structured Pathya-Apathya framework positions this approach not as an alternative to evidence-based medicine but as an immunologically grounded integrative strategy warranting rigorous scientific evaluation.^[9–14]

Future research priorities should include: double-blind randomised controlled trials measuring recurrence frequency (Paradise criteria),^[8] mucosal immune biomarkers (sIgA, NK cell percentage, IL-6, CRP, tonsillar lymphocyte proliferation indices),^[9,10] and pediatric quality-of-life scores in children receiving standardised Ayurvedic Rasayana protocols over a 12-month intervention period. Pharmaceutical standardisation of pediatric Rasayana dosage forms — with validated marker compound assays, microbial safety profiles, and age-stratified pharmacokinetic data — represents the essential translational bridge between classical formulations and globally recognised evidence-based integrative pediatric medicine.^[13,15]

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