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Integrative analysis of the gut–lung axis and annavaha srotodushti in tamaka shwasa (bronchial asthma)

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Abstract:

Bronchial Asthma, described as *Tamaka Shwasa* in Ayurveda, is recognised as a chronic inflammatory disorder of the airways with a complex and multifactorial origin. Modern biomedical research increasingly draws attention to the *Gut–Lung Axis*, a dynamic two-way communication network between the gastrointestinal tract and the respiratory system. This connection is influenced by gut microbiota, immune mediators, microbial metabolites, and various neuro-endocrine pathways that together shape respiratory immunity and inflammation.

Ayurveda emphasises the close relationship between digestive health and respiratory function. The role of *Annavaha Srotas*, the channel responsible for digestion, absorption, and nourishment, is considered crucial in the development of *Tamaka Shwasa*. Imbalances in *Agni*, formation of *Ama*, *Srotodushti*, and disturbances in systemic *Doshas* are described as contributing factors that weaken the respiratory channels and predispose individuals to recurrent episodes of breathlessness. These classical

concepts correspond closely with emerging scientific understandings of gut dysbiosis, altered metabolic signalling, and immune dysfunction observed in asthma.

The present paper aims to explore the integrative relevance of *Annavaha Srotas* and the *Gut–Lung Axis* in explaining the pathogenesis, phenotypes, and progression of *Tamaka Shwasa* (Bronchial Asthma). By drawing correlations between Ayurvedic theory and contemporary biomedical evidence, the study attempts to develop a broader interdisciplinary perspective. This approach highlights the importance of maintaining digestive strength, gut microbial balance, and metabolic stability as key determinants of respiratory health and offers insights for preventive as well as multidimensional therapeutic strategies.

Keywords :- *Tamaka Shwasa*, Gut–Lung Axis, *Annavaha Srotas*, Bronchial Asthma, *Agni*, *Ama*

Introduction

Annavaha Srotas plays a fundamental role in the manifestation of most diseases, as its *Mulasthan* is described as *Amasaya* and *Vama Parsva*.

According to *Ayurvedic* principles, the origin of disease is primarily attributed to *Agnimandya*; therefore, assessment of *Annavaha Srotodushti Lakshanas* is essential for understanding disease pathogenesis. The global prevalence of *Shwasa Roga* is increasing due to altered dietary habits, environmental pollution, psychological stress, and sedentary lifestyles, with an estimated worldwide prevalence of approximately 4.2%. *Tamaka Shwasa*, classified under *Shwasa Roga*, is a *Vata-Kapha Pradhana Vyadhi* and closely correlates with bronchial asthma. Classical texts describe symptoms such as *Shwasa Kashtata*, *Peenasa*, *Ghurghuraka Shabda*, *Tivra Vega Shwasa*, *Kasa*, and *Pramoha*, precipitated by *Abhishyandi* and *Viruddha Ahara*, leading to *Annavaha Srotodushti*. Modern science highlights immune dysregulation and the Gut–Lung Axis, which parallels the *Ayurvedic Annavaha–Pranavaha Srotas* relationship, emphasizing digestive health in respiratory disorders.

Aims and Objectives

Aim

To analyse the integrative role of the *Gut–Lung Axis* and *Annavaha Srotas* in the pathogenesis and progression of *Tamaka Shwasa* (Bronchial Asthma).

Objectives

1. To explore the Ayurvedic understanding of *Annavaha Srotas* and its role in *Tamaka Shwasa*.
2. To review modern scientific evidence related to the *Gut–Lung Axis*.
3. To analyse parallels between the Ayurvedic concept of *Ama* and modern metabolic and inflammatory markers.
4. To propose an integrated pathophysiological model linking digestion with respiratory immunity.

Materials and Methods

Classical Ayurvedic texts including *Charaka Samhita*, *Sushruta Samhita*, and *Ashtanga Hridaya*, along with authoritative commentaries, were reviewed. In addition, relevant research articles, reviews, and peer-reviewed biomedical literature were consulted to correlate traditional Ayurvedic concepts with contemporary scientific understanding.

REVIEW OF LITERATURE

1. *Charak Samhita* - *Srotas* definition, *srotas moolasthanas* and their vitiation *hetu*, their *dushti lakshanas* are mentioned in *Vimansthana*^[1] 5th *adhyaya* named *Strotovimanam adhyaya* and *dhatuvaha srotas pradoshaj vikara* mentioned in *sutrasthana*^[2] 28th *adhyaya* named *Vividhaashitpitivyadhyaya*. *Annavaha strotas dushti hetu* and *lakshanas*, *chikitsa* are mentioned in *Vimansthana* 5th *adhyaya*. In *chikitsasthana*^[3] 17th *adhyaya* named *Hikkashwasachikitsaadhyaya* *Tamak shwasa hetu*, *lakshana* and *chikitsa* is mentioned.
2. *Sushruta Samhita* - *Uttartantra* 51th *Shwasaadhisheya adhyaya*^[4] *Tamaka Shwasa lakshana* and *chikitsa* is mentioned with *Shwasa prakara*.
3. *Vagbhat Samhita*-. *Astang hridaya Nidan sthana* 4th *Shwasahidhmanidanadhyaya*^[5] *Shwasa prakara* with *nidan panchaka* and *tamak shwas lakshana* and *hetu*, *samprapti* has also mentioned. In *chikitsasthana* 4th *Shwasahidhmachikistitam*^[6] *adhyaya* detailed *chikitsa* mentioned by *acharya vagbhat*.
4. *Madhav Nidan* - It is important literature regarding the diagnosis, etiology, symptomology, pathology, & complication of *Shwasa vyadhi* described in 12th *Hikkashwasanidanam*^[7] *adhyaya*.

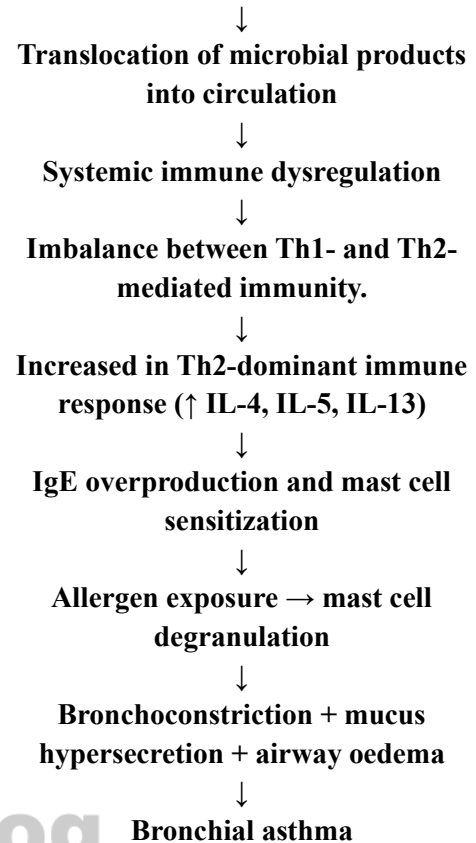
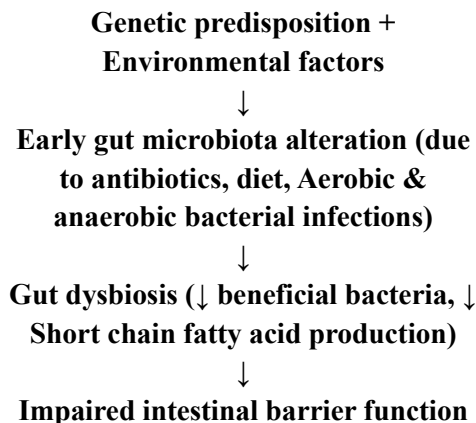
Also, *Tamak shwasa nidan* mentioned in detail.

5. Robbins & Cotran^[8] Pathologic Basis of Disease Book by Jon C. Aster- Asthma definition, symptoms, diagnosis criteria and investigation and etiopathogenesis given.
6. Davidson's ^[9] principal practice of Medicine- Pathophysiology, clinical features, and diagnosis and treatment of Bronchial Asthma is described in detail. Also, Pulmonary function test, blood investigation, spirometry test has given in the context of asthma.

Discussion: -

Asthma^[10] is a chronic disorder of the conducting airways, usually caused by an immunological reaction, which is marked by episodic bronchoconstriction due to increased airway sensitivity to a variety of stimuli; inflammation of the bronchial walls; and increased mucus secretion. The disease is manifested by recurrent episodes of wheezing, breathlessness, chest tightness, and cough, particularly at night and/or in the early morning.

Contemporary pathophysiology of Bronchial Asthma: -



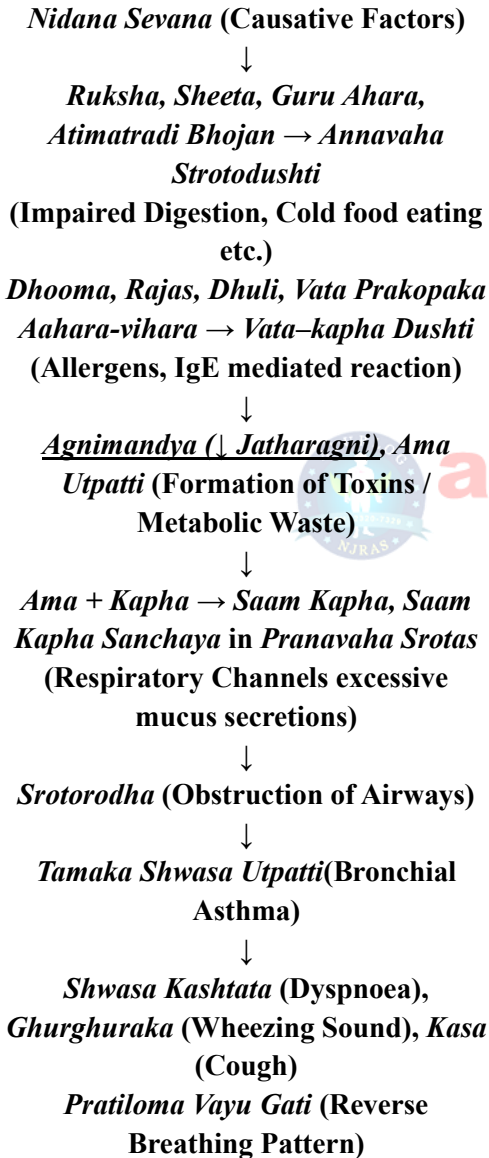
Gut–Lung Axis^[11]: Modern Perspective

The gut–lung axis describes a dynamic, bidirectional communication network between the gastrointestinal system and the respiratory tract, facilitated by immune signalling pathways, microbial metabolites, and inflammatory mediators. Alterations in the composition of the gut microbiota, commonly referred to as dysbiosis, can disrupt immune homeostasis, skew immune responses toward Th2 dominance, and thereby enhance susceptibility to allergic airway disorders, including bronchial asthma.

Metabolites such as short-chain fatty acids^[12], generated by a healthy and diverse gut microbiota, exert protective anti-inflammatory effects on pulmonary tissues. In contrast, gut microbial imbalance contributes to systemic inflammation and increased airway hyperresponsiveness. Several clinical and epidemiological studies have demonstrated a

significant association between early-life disturbances of the gut microbiome—often resulting from antibiotic exposure—and an elevated risk of developing asthma later in life.

Classical ayurvedic *samprapti* of Tamaka shwasa in view of *annavaha strotas* mainly causing agnimandya and its directly manifestation in *pranavaha strotas* resulting in *tamaka shwasa*.

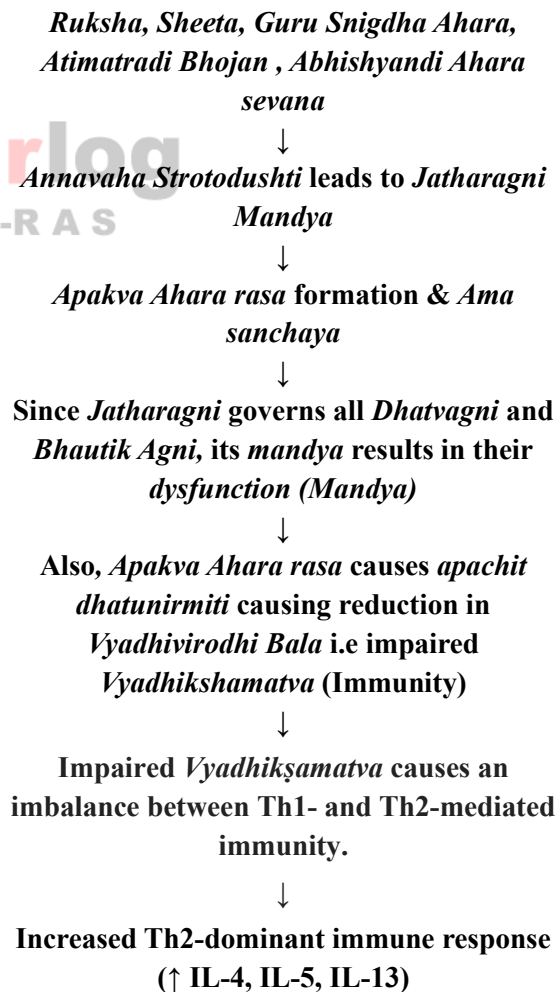


According to *Charaka Samhita*, *Tamaka Shwasa* is a *Kapha-Vata Pradhana Vyadhi* with its origin in *Pitta Sthana* (*Pittasthanasamudbhava*). The

disease progresses when aggravated *Kapha* obstructs the respiratory channels, leading to *Vata Avarana*. This results in symptoms such as *Ghurghuraka* (wheezing), *Shwasakrichhrata* (dyspnea), *Kasa*, and recurrent attacks, often precipitated by indigestion, cold exposure, and dietary indiscretions.

The involvement of *Amashaya* indicates that *Tamaka Shwasa* is not merely a localized respiratory disorder but a systemic disease rooted in digestive pathology. Hence, correction of Agni and elimination of Ama form the cornerstone of its management.

This is the classical *ayurvedic samprapti* in accordance with *annavaha strotodushti* and *agnimandya* affecting *vyadhikshamatva* and resulting in *tamaka shwasa* (Bronchial asthma)



↓

It causes hyperresponsiveness of bronchus and respiratory track resulting in bronchial asthma.

According to Ayurveda, habitual intake of *Ruksha, Sheeta, Guru, and Snigdha Ahara*, excessive food consumption (*Atimatra Bhojana*), and *Abhishyandi Ahara Sevana* lead to *Annavaaha Srotodushti* and *Jatharagni Mandya*. Impaired digestion results in formation of *Apakva Ahara Rasa* and accumulation of *Ama*. Since *Jatharagni* governs all *Dhatvagni* and *Bhautik Agni*, its impairment leads to defective tissue metabolism and reduced *Vyadhikshamatva*.

Diminished *Vyadhikshamatva* results in immune imbalance comparable to Th1–Th2 dysregulation, favouring Th2 dominance. The association of *Ama* with *Kapha Dosha* leads to *Saama Kapha* accumulation in *Pranavaaha Srotas*, causing *Srotorodha*. This obstruction results in *Vata Avarana* and manifests clinically as *Tamaka Shwasa*, characterised by *Shwasa Kashtata, Ghurghuraka, Kasa, and Pratiloma Vayu Gati*.

Classical references describe *Tamaka Shwasa* as a *Kapha–Vata Pradhana Vyadhi* originating from *Pitta Sthana* (*Pittasthanasamudbhava*). According to *Chakrapani's Tika*, *Pitta Sthana* is identified as *Amashaya*, which is the *Mūlasthāna* of *Annavaaha Srotas* and the primary seat of *Agni*. This confirms that *Tamaka Shwasa* is fundamentally rooted in digestive pathology rather than being a purely respiratory disorder.

कफवातात्मकावेतौ^[13] पित्तस्थानसमुद्भवौ ।
हृदयस्य रसादीनां धातूनां चोपशेषणौ ॥८॥

In *Charaka Samhita*, it is clearly mentioned that *Tamaka Shwasa* originates from the *Annavaaha Srotas*. In the above *śloka*, the term “पित्तस्थानसमुद्भवौ” indicates that *Tamaka Shwasa* arises from the *Pitta Sthāna*. According to *Chakrapani's Tīkā*, the *Pitta Sthāna* is identified as the *Āmāśaya*, which is also the *Mūlasthāna* of *Annavaaha Srotas*, where *Agni* resides. Also, *Aam*

is a *hetu* of *Tamaka shwasa*, which is get accumulate in the body due to *Jatharaagnimandya*. Treating gut health improve asthma control, ayurvedic interventions (*Deepana-Pachana, Langhana, Shodhana*) reduce inflammation.

Conclusion: -

The integrative analysis of *Tamaka Shwasa* underscores that digestive dysfunction arising from derangement of the *Annavaaha Srotas* and impairment of *Agni* plays a central role in disease pathogenesis. The contemporary concept of the *Gut–Lung Axis* lends scientific support to classical Ayurvedic principles by elucidating the close interrelationship between gut health, immune regulation, and respiratory function. Accordingly, therapeutic approaches aimed at restoring *Agni*, eliminating *Ama*, re-establishing gut microbial homeostasis, and enhancing *Vyadhikshamatva* may provide a comprehensive and sustainable strategy for the management of Bronchial Asthma.

This integrative framework highlights a meaningful convergence between the Ayurvedic understanding of *Annavaaha Srotas* and modern insights into the *Gut–Lung Axis*, emphasizing the pivotal influence of digestive health on inflammatory and immune mechanisms underlying respiratory disease. Viewing *Tamaka Shwasa* through both paradigms reinforces the necessity of addressing gastrointestinal dysfunction as a core component of effective asthma management. Further interdisciplinary and clinical investigations are arranged to substantiate these correlations using objective biomarkers and to evaluate therapeutic outcomes.

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