



REVIEW ARTICLE

Annava Srotodushti and Cholelithiasis: A Review of Ayurvedic Concepts and Modern Perspectives

Sudharseni P¹, Pradeep K²

¹Final year PG Scholar, KUHS, Department of Kriyasareera, Govt. Ayurveda College, Kannur

²Associate Professor, Department of Kriyasareera, Govt. Ayurveda College, Kannur

*Email: sudhatrp96@gmail.com

ARTICLE HISTORY

Received: 04 July 2025

Accepted: 19 September 2025

Available online

Version 1.0 : 30 September 2025

Keywords

Gastrointestinal tract, *Annava srotas*, *Annava Srotodushti*, Cholelithiasis, Gallstones.

Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at <https://keralajournalofayurveda.org/index.php/kja/open-access-policy>

Publisher's Note: All Kerala Govt. Ayurveda College Teacher's Association remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Copyright: © The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited (<https://creativecommons.org/licenses/by/4.0/>)

CITE THIS ARTICLE

Sudharseni P, Pradeep K. *Annava Srotodushti* and Cholelithiasis: A Review of

Ayurvedic Concepts and Modern Perspectives. Kerala Journal of Ayurveda. 2025;4(3):19-24.

<https://doi.org/10.55718/kja.434>

Abstract

Background: Digestion is essential for maintaining good health and proper body functions. In Ayurveda, the body is described as a system of interconnected channels (*Srotas*) that facilitate the transport and transformation of bodily elements (*Sharirbhava*, including *Dhatus*). Among these, *Annava Srotas* plays a vital role in the digestion, absorption, and movement of food. Classical texts describe its *Moolasthanas* (root sites) as the *Amashaya* (stomach) and *Vamaparshwa* (left flank) according to Charaka, and the *Amashaya* and *Annavahini Dhamani* according to Sushruta. **Objective:** To assess the role of *Annava Srotas* in the pathogenesis of cholelithiasis by integrating Ayurvedic principles with contemporary scientific evidence. **Methods:** A narrative review was conducted using classical Ayurvedic texts and modern research literature to understand the anatomical, physiological, and pathological relevance of *Annava Srotas* and its association with gallstone disease. **Results:** Modern lifestyle factors such as irregular eating habits, excessive junk food intake, sedentary routines, and stress were found to disrupt digestion and contribute to the development of gallstone disease (cholelithiasis). Cholelithiasis involves the biliary tree, a network of ducts that carries bile from the liver and gallbladder to the small intestine, and is primarily caused by imbalances in bile components such as cholesterol, bile pigments, and calcium salts. Ayurveda, while not explicitly mentioning the gallbladder, associates bile secretion with *Accha Pitta*. Impairment of *Annava Srotas* may disturb *Pitta* flow and digestion, suggesting a possible link between *Annava Srotodushti* and gallstone pathogenesis. **Conclusion:** Cholelithiasis and post-cholecystectomy complications are closely associated with disturbed digestion and bile metabolism, which may reflect vitiation of *Annava Srotas*. Understanding the health of these channels through an Ayurvedic perspective could provide valuable insights for the prevention and management of gallstone disease.



Introduction

Ayurveda emphasizes *Swasthasya Swasthyarakshanam* (maintaining the health of the healthy) and *Vyadhiparimokshan* (prevention and management of disease).^[1] Central to this approach is the concept of *Srotas*, or bodily channels, which function as vital internal transport systems. When these channels become disturbed a condition known as *Srotodushti*, various health issues arise.^[2] These disturbances may manifest as *Atipravrutti* (excessive flow), *Sanga* (blockage), *Siragranthi* (nodular formations), or *Vimargagamana* (abnormal flow). *Annavaaha Srotas* is a key channel system in Ayurveda.^[1] It plays a vital role in digestion and nutrient absorption, involving organs such as the mouth, esophagus, stomach (*Aamashaya*), and small intestine (*Kshudranta*). According to classical Ayurvedic texts, *Charaka* identifies the root of *Annavaaha Srotas* in the stomach and the left side of the abdomen (*Vamaparshva*), while *Sushruta* describes its root as the *Aamashaya* and *Annavaahini dhamanis*.^[3] Proper digestion, *Rasadhatu* formation, and *Agni* regulation depend on its function.^[4] Disturbances in *Agni* and *Annavaaha srotas* can impair digestion, metabolism, and nutrient absorption, leading to disease. Such disturbances are often caused by improper diet, overeating, and mental stress (*chittodvega*), resulting in *Tridosha* imbalances.^[5] Symptoms include *Anannaabhilasha* (aversion towards food), *Arochaka* (tastelessness), *Avipaka* (indigestion), and *Chardi* (vomiting).^[6] In severe cases, damage to *Annavaaha srotas* may lead to *Adhmaana* (bloating), *Shula* (pain), *Pipasa* (excessive thirst), *Andhya* (blindness), or even *Maranam* (death).^[7] Diseases like *Amlapitta* (acid reflux), *Grahani* (IBS-like disorder), and *Udara Roga* (abdominal disorders) are linked to this vital *srotas*, also referred to as *Mahasrotas*.^[8] In modern medicine, the gastrointestinal (GI) tract is a continuous system from the mouth to the anus, supported by accessory organs such as the tongue, salivary glands, pancreas, liver, and gallbladder.^[1] The gallbladder stores and concentrates bile to aid in fat digestion. Bile, produced by hepatocytes in the liver, is transported through the biliary tree to the duodenum, especially after a fatty meal, under the influence of cholecystokinin (CCK).^[9] Bile production or flow disruptions can impair digestion and cholesterol metabolism, leading to cholelithiasis (gallstone formation).^[10]

Cholelithiasis is a common gastrointestinal condition that significantly affects digestive health. It can interfere with bile secretion, fat metabolism, and nutrient absorption. The term Cholecystitis refers to the inflammation of the gallbladder, leading to pain, digestive disturbances, and systemic complications.^[11] Gallstone disease (GSD) is often diagnosed incidentally via ultrasound, though its prevalence is increasing due to factors like poor dietary habits, sedentary lifestyle, and

lipid metabolism disorders.^[12] Risk factors include obesity, age over 40, family history, prolonged fasting, and high-fat diets.^[13] While many cases remain asymptomatic, others present with symptoms such as abdominal pain, nausea, vomiting, fever, and jaundice, sometimes requiring surgical intervention.^[8] The most common treatment is laparoscopic cholecystectomy, but studies show this may lead to post-operative issues like bile acid imbalance, dyspepsia, and motility disturbances.^[14] Despite the high global burden of gallstone disease, there is limited research exploring its pathogenesis and prevention from an Ayurvedic perspective. Although not explicitly described in classical texts, gallstone formation and symptoms can be correlated with *Nidana*, *Lakshana*, and *Samprapti* of *Annavaaha Srotodushti*.^[15] The liver, gallbladder, and bile ducts can be considered parts of the *Annavaaha Srotas*, linking Ayurvedic principles with modern understanding. Limited research has explored this connection, indicating the need for integrative, preventive approaches that emphasize digestive health and lifestyle regulation.

Materials & methods

This manuscript was prepared using a narrative review approach. Information was compiled from classical Ayurvedic texts, including the *Brhatrayi* (*Caraka Samhita*, *Susruta Samhita*, and *Astanga Hridaya*), as well as the *Laghutrayi*, and modern textbooks on physiology and gastroenterology. A literature search was conducted in online databases, including PubMed and MEDLINE, to retrieve relevant scholarly articles. The search was performed for the time frame of January 2000 to June 2025, using keywords such as “*Annavaaha Srotas*,” “*Srotodushti*,” “*Ayurveda* and *gallstone disease*,” “*cholelithiasis*,” “*bile metabolism*,” and “*Ayurvedic gastroenterology*.” Additional articles were identified from the reference lists of key publications. Both classical Ayurvedic descriptions and contemporary biomedical studies were critically reviewed and synthesized to develop an integrative understanding of the pathogenesis of cholelithiasis from an Ayurvedic perspective.

Result

Concept of *Annavaaha Srotodushti* in Ayurveda

Annavaaha Srotas, derived from “*Anna*” (food) and “*Srotas*” (channel), refers to the digestive pathway responsible for the digestion, absorption, and metabolism of food, which is essential for sustaining life.^[3] According to Acharya *Sushruta*, *Matrija Bhava* plays a key role in the formation of *Annavaaha Srotas*. Here, *Pitta* transforms the subtle essence of *Rakta* and *Kapha*, and with the movement of *Vayu*, structures such as *Antra*, *Guda*, and *Basti* are formed.^[16] The *Moolasthan* (root

location) of *Annavaha Srotas*, as described by Charaka and Sushruta, includes the stomach (*Amashaya*) and the left abdomen (*Vama Parshwa*), where digestion begins and nutrients are separated. The *Annavahini* Dhamani, a channel extending from the mouth to the stomach, carries food through the digestive tract, with digestion and absorption continuing up to the end of the small intestine.^[3] The *Annavaha Srotas* includes organs of the gastrointestinal tract a continuous tube from the mouth to the anus as well as accessory digestive organs such as the teeth, tongue, salivary glands, liver, gallbladder, and pancreas. These structures collectively contribute to ingestion, digestion, absorption, and waste elimination. Food undergoes initial digestion (*Prapaka*) after ingestion, influenced by the six tastes, and subsequently progresses through three sequential stages of *Annapachana* (digestion).^[17] The first stage, *Madhura Avasthapaka*, takes place in the stomach under the influence of *Kledaka Kapha*, which moistens and liquefies the ingested food. This is followed by *Amla Avasthapaka*, driven by *Pachaka Pitta* in the stomach and small intestine, where further breakdown and acidification occur. During this stage, *Accha Pitta* is formed, which closely resembles bile stored in the gallbladder. The final stage, *Katu Avasthapaka*, occurs in the large intestine (*Purisavaha Srotas*) under the influence of *Vata* and is responsible for water absorption and elimination of waste products.^[18]

Role of *Agni* in Digestion and Metabolism - *Agni*, particularly *Pachaka Pitta* and *Jatharagni* located in the stomach and small intestine, plays a crucial role in digestion and *Rasadhatu* formation within *Annavaha srotas*. It separates food into absorbable nutrients and waste products, thereby supporting metabolism. Balanced *Agni* ensures good health, while its imbalance leads to digestive disorders. Since *Jatharagni* is the core digestive force, the functioning of *Annavaha srotas* relies entirely on its balance, and any weakness (*Jatharagnimandya*) initiates disease from this system.^[19,20]

Pittadharakala, located between the stomach and large intestine, houses the digestive fire (*Antaragni*) essential for digestion and absorption.^[21] At the same time, *Grahani*, the seat of *Agni*, regulates digestion by holding food until it's fully processed. Imbalances in these areas can disrupt digestive functions.^[22]

Causes of *Annavaha srotodushti* (Disorders of Digestive System) - According to Acharya Charaka, *Annavaha srotodushti* arises from improper diet, lifestyle, and mental stress, including factors like overeating, untimely or unhealthy food, sedentary habits, irregular routines, and psychological disturbances such as anxiety and depression.^[6]

Symptoms of *Annavaha srotodushti* - *Annavaha srotodushti* is marked by symptoms like disinterest in food (*Anannaabhilasha*), tastelessness (*Arochaka*), indigestion (*Avipaka*), and a tendency to vomit (*Chardi*).^[23] *Agnimandya*, or weak digestion, is considered the root of all digestive issues, with imbalanced *Agni* first affecting *Annavaha Srotas* and potentially leading to systemic disorders. Common related conditions include *Ajirna*, *Alasaka*, *Visuchika*, *Chardi*, *Amlapitta*, *Shula*, *Parinamasula*, *Grahani*, *Adhmana*, *Udavarta*, *Arochaka*, *Bhasmaka*, and *Krimi*.^[6] According to Acharya Charaka, the management of *Annavaha Srotas* disorders involves three key approaches: *Nidana Parivarjan* (eliminating the cause), *Samshodhana* (detoxification), and *Samshamana* (palliative therapy). Since these disorders often stem from *Ama* (undigested toxins), treatment focuses on *Deepana* (appetite-stimulating) and *Pachana* (digestive) therapies, using herbs with *Tikta* (bitter) and *Katu* (pungent) tastes to restore the proper function of *Annavaha Srotas*.^[17,13]

Cholelithiasis (Gallstone)

From a modern viewpoint, bile, produced by the liver and stored in the gallbladder, is crucial for fat digestion, vitamin absorption, and lipid regulation.^[8] The gallbladder concentrates bile and releases it into the small intestine in response to fatty food, triggered by the hormone cholecystokinin (CCK).^[9] This process helps emulsify fats, making them easier for enzymes like lipase to digest, while also protecting digestive organs from harmful bile acids. Bile acids play a key role in maintaining bile solubility, aiding fat digestion, and regulating metabolism and gut function.^[7] Disruption in bile acid balance can alter bile composition, leading to cholesterol or pigment precipitation and gallstone formation. Gallstones are classified as cholesterol stones (due to excess bile cholesterol), pigment stones (linked to bilirubin metabolism issues), and mixed stones.^[19]

Gallstone pathophysiology involves the crystallization of bile components, forming stones that may obstruct bile flow.^[8] Contributing factors include high-fat diets, sedentary lifestyles, aging (causing increased cholesterol secretion and reduced bile acid pool), prolonged fasting, parenteral nutrition, pregnancy, medications like Octreotide, and drugs like Clofibrate. Genetic predisposition also plays a role, accounting for around 25% of cases.^[9]

Gallstone pathogenesis involves bile supersaturation with cholesterol or bilirubin, leading to crystal formation and stone growth due to an imbalance in bile components. Key metabolic risk factors include obesity, insulin resistance, type 2 diabetes, and NAFLD (Non-alcoholic fatty liver disease), all of which affect cholesterol and bile acid metabolism.^[9] Gallstones

often cause severe abdominal pain (biliary colic), especially after fatty meals, and may be accompanied by fever if inflammation occurs. Gallbladder dysfunction can impair fat digestion, cause bloating, nausea, fatty stools, and, in severe cases, lead to jaundice or pancreatitis. Post-cholecystectomy, altered bile flow may affect fat digestion. [8] Clinically, cholesterol stones arise from cholesterol imbalance, pigment stones from bilirubin metabolism issues, and both are linked to increased gallbladder cancer risk. [24,25]

The Role of Annavaaha srotas in gallstone formation

The disease involving the biliary tree, a network of ducts that transport bile, is closely linked to poor digestion and metabolism, leading to bile stagnation and stone formation. Ayurvedic texts may relate this to the vitiation of Annavaaha Srotas, resulting from improper diet and lifestyle habits that weaken the digestive fire (Agni) and disrupt the balance of the doshas Vata, Pitta, and Kapha. The primary sites involved include the Amashaya (stomach), Yakrit (liver), Pittaashaya (gallbladder), and Pakvashaya (intestines), all crucial for digestion and bile regulation. [16,21, 24]

Gallstones are considered Pitta-related disorders, resulting from an aggravated Pitta that leads to bile saturation, Kapha-induced bile thickening, and Agnimandya, which disrupts fat metabolism [22]. Such disturbances in Annavaaha Srotas can present clinically as biliary colic, fever from infection, nausea, vomiting, and jaundice due to bile duct blockage, reflecting the Ayurvedic perspective on the development of gallstones [26,27].

Discussion

In Ayurveda, Annavaaha Srotas is responsible for the intake, digestion, absorption, and metabolism of food, involving organs such as the stomach (Amashaya), liver (Yakrit), gallbladder (Pittashaya), and intestines (Pakvashaya). According to Charaka, the Moolsthana of the Annavaaha Srotas lies in the Amashaya

and Vama Parshwa (left side of the body), where the primary digestion and separation of food into Sara (essence) and Kitta (waste) occur. Sushruta further emphasizes the Annavahini Dhamani as a Moolsthana, highlighting its role in transporting nutrients throughout the body. While Amashaya is generally understood to be the stomach, a broader anatomical understanding includes the oesophagus, stomach, and small intestine, as digestion and absorption extend throughout these regions. As per the opinion of Charaka, Parshwa refers to the regions on either side of the body's midline, including the stomach (left hypochondria) and the initial part of the small intestine (right side). Hence, the concept of Parshwa also extends to accessory organs like the liver and gallbladder, highlighting their essential roles in bile production and fat digestion. Accha Pitta, formed during the second stage of digestion, resembles bile in the gallbladder, supporting the term Pittashaya. The liver secretes 500-600 ml of bile daily, aiding fat digestion, vitamin absorption, and bacterial control functions, matching Accha Pitta's role in Pachana Karma. These functions are crucial for maintaining the integrity of the Annavaaha Srotas and preventing disorders such as gallstones. Disruptions in Agni (digestive fire), imbalance of doshas, or impaired bile flow can lead to srotodushti (channel dysfunction), ultimately resulting in digestive disturbances and the formation of gallstones.

Pathogenesis: Gallstone formation is linked to dysfunctions in Annavaaha Srotas. Prana Vayu governs food intake, while Samana Vayu controls digestion. Pachaka Pitta and Jatharagni regulate fat metabolism, and Kledaka Kapha moistens the food. An imbalance between Kapha and Pitta can lead to bile stasis, thickened bile, and elevated cholesterol and bilirubin, contributing to gallstones. Aggravated Vata can disrupt bile flow, worsening the condition.

Modern science supports this by highlighting impaired bile secretion, cholesterol metabolism, and bile stasis as key factors, mirroring Ayurvedic concepts of Agnimandya and

TABLE 1: Annavaaha srotas Injury (Viddha Lakshana) and Its Association with Cholelithiasis:

ANNAVA SROTAS	GALLSTONE SYMPTOMS
Agnimandya	Indigestion, bloating
Aruchi	Loss of appetite
Amlodgara	Acid reflux, heartburn
Udarashoola (abdominal pain)	Right upper abdominal pain
Pittaja shotha (inflammation of the gallbladder)	Cholecystitis (swelling of the gallbladder)
Pandu (yellowish discoloration)	Jaundice (due to bile obstruction)
Vibandha (constipation) or Atisara (diarrhoea)	Irregular bowel movements, IBS
Andhya	Although gallstone disease does not directly cause blindness (Andhya), there are indirect connections. Obstruction of bile flow can impair the absorption of fat-soluble vitamins, particularly vitamin A, leading to night blindness (nyctalopia). Additionally, elevated bilirubin levels in jaundice may contribute to retinal toxicity and visual disturbances. Some autoimmune disorders, such as primary sclerosing cholangitis, which affects the gallbladder, may also involve ocular complications like uveitis, linking gallbladder dysfunction with potential eye disorders. [28,29]

srotasdushti. Poor dietary habits, psychological stress, and sedentary lifestyle further aggravate the dysfunction of *Annavaaha srotas*, promoting gallstone formation. *Srotodushti* in the case of gallstones manifests as *Sanga* (obstruction), *Atipravritti* (excess secretion), *Vimarga Gamana* (misdirected flow), and *Sira Granthi* (blockages and stone formation), all of which disrupt the normal physiological functions of the digestive channels.

Preventive measures in Ayurveda emphasize a balanced *Ahara* and *Vihara*, using *Deepana-Pachana* herbs, detoxification through *Panchakarma*, and restoring balance with *Samshamana Chikitsa*. Emphasis is placed on avoiding causative factors (*Nidan Parivarjana*) to maintain *Annavaaha Srotas* health and prevent gallstone formation. Post-cholecystectomy complications like dyspepsia and motility issues align with Ayurvedic teachings on disrupted *Annavaaha Srotas*. Thus, Ayurveda provides a comprehensive framework for gallstone disease management by addressing root causes through appropriate diet, lifestyle regulation, and herbal therapies, in integration with modern medical practices.

Limitations

This review is primarily a narrative synthesis based on classical Ayurvedic texts and available biomedical literature. Although care was taken to include comprehensive sources, there may be selection bias due to the limited availability of clinical studies directly linking *Annavaaha Srotodushti* and cholelithiasis. The review does not include quantitative meta-analysis, which could have provided statistical strength to the findings.

Future Research Directions

Further studies are needed to develop standardized diagnostic tools to assess *Annavaaha Srotodushti* in clinical settings and correlate them with biochemical parameters of bile metabolism. Interventional trials exploring *Deepana-Pachana* herbs, *Panchakarma* procedures, and lifestyle modifications for gallstone prevention and post-cholecystectomy management would help validate Ayurvedic concepts scientifically. Integrative studies comparing outcomes of modern treatments with combined Ayurvedic regimens may also open new pathways for evidence-based management of gallstone disease.

CONCLUSION

In conclusion, the formation of gallstones (cholelithiasis) can be effectively understood by integrating modern medical research with Ayurvedic principles, particularly through the concept of *Annavaaha Srotas*, which governs digestion, absorption, and metabolism. Disruptions in bile flow, bile stasis, and cholesterol metabolism, common in gallstone formation, align with

Ayurvedic concepts like *Agnimandya* (weak digestion) and *srotas dushti* (disruption of bodily channels). Factors including poor diet, sedentary lifestyle, and stress exacerbate these imbalances.

Ayurvedic treatments, including *Nidana Parivarjana* (eliminating causes), *Deepana-Pachana dravya* (digestive herbs), *Panchakarma* (detoxification), and *Samshamana* (palliative care), offer a holistic approach to restoring balance and preventing gallstones. By integrating traditional practices with modern insights, a more holistic and lasting approach to preventing and managing gallstone disease can be developed, highlighting the significance of digestive health and early intervention.

References

1. A review article on Annavaaha Srotas: Ayurveda and modern view. *J World Pharm Sci*. 2019;5(4):100-103.
2. Diagnosis approaches of Annavaaha Srotas & Purisvaha Srotas Dusti Lakshana w.s.r. to gastrointestinal disorders. *J World Pharm Sci*. 2021;7(9):189-195.
3. Gole N, Gupta P, Bhalerao N, Yadav AK. A critical study of Annavaaha Srotas with special reference to its developmental anatomy. *Int Ayurvedic Med J*. 2021;9(7):1521-1528.
4. Sahoo PP, Syamlal S, Raje K. A review of Annavaaha Sroto Viddha Lakshana w.s.r. to Andhya. *J Ayurveda Integr Med*. 2023; ISSN 2456-3110.8(9):167-172. doi:10.21760/jaims.8.9.27.
5. Understanding Agni and its clinical application in Annavaaha disorders. *J Ayurveda Integr Med Sci*. 2023;10(9):31-34.
6. Agnivesha. *Caraka Samhita*, Chikitsa Sthana, Vimana Vibhaga 5/8. In: Charaka, editor. Varanasi: Chaukhambha Sanskrit Sansthan; 2015.
7. Sushruta. *Sushruta Samhita*, Sharira Sthana 9/12. In: Sushruta, editor. Varanasi: Chaukhambha Sanskrit Sansthan; 2015.
8. Agnivesha. *Caraka Samhita*, Vimana Sthana, Trividha Roga Visheshha Vijnaniya Vimana. In: Charaka, with Deepika commentary by Chakrapanidatta, editors. Varanasi: Chaukhambha Orientalia; 2015.
9. Hundt M, Basit H, John S. Physiology: Bile Secretion [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Sep 26 [updated]; [cited 2025 Jan]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK470209/>
10. Jones MW, Weir CB, Ghassemzadeh S. Gallstones (Cholelithiasis) [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan [updated 2024 Aug 17; cited 2025 May]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK459370/>
11. Dan WY, Yang YS, Peng LH, Sun G, Wang ZK. Gastrointestinal microbiome and cholelithiasis: current status and perspectives. *World J Gastroenterol*. 2023;29(10):1589-1601.
12. Stinton LM, Shaffer EA. Epidemiology of gallbladder disease: cholelithiasis and cancer. *Gut Liver*. 2012;6(2):172-187.
13. Chen L, Lv G, Yang H. *Insights into modifiable risk factors of cholelithiasis: a Mendelian randomization study*. *Hepatology*. 2022;75(3):785-796. doi:10.1002/hep.32183

14. Hassler KR, Collins JT, Philip K, et al. Laparoscopic cholecystectomy. *StatPearls* [Internet]. Treasure Island (FL): StatPearls Publishing; [cited 2025 May]. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK448145/>
15. Yadav N, Singh AK. Common Annavaha Srotas Vikara and their management. *Int Ayurvedic Med J.* 2022;9(8):2240-2243
16. Thatte D. *Sushruta Samhita*, Sharira Sthana. Vol. 3. Varanasi: Chaukhamba Orientalia; 1994. p.174.
17. Khedikar S. Critical study of Annavaha Srotas Moolsthana w.s.r. to Annavaha. *Int J Ayurvedic Med.* 2017;6(2):123-127.
18. Patel J, Kumar D, et al. Today's modernistic lifestyle and its impact on Annavaha Sroto Dushti. *Int J Multidiscip Res Rev.* 2019;4(3):45-49.
19. Sharma RK, Dash B. *Charaka Samhita of Agnivesha*. Vol II, Chikitsa Sthana, Ch.15, Verses 56-57. Varanasi: Chaukhambha Sanskrit Series Office; 2014.
20. Sharma PV. *Sushruta Samhita with English Translation*. Vol I, Sharira Sthana, Ch.4, Verse 18. Varanasi: Chaukhambha Visvabharati; 2010.
21. Paijwar P, Gajbhiye A. Concept of Pittadharakala and its modern perspective. *Bioinformatics Biomed J.* 2022;4(3):89-92.
22. Sharma H. Agni in Ayurveda: conceptual and clinical aspects. *Ayu.* 2011;32(4):516-520.
23. Dr Sreekumar T. *Ayurveda Physiology*. 1st ed. Kerala: Harisree Publications; 2022. p.34-37.
24. Han X, Wang J, Wu Y, Gu H, Zhao N, Liao X, et al. Predictive value of bile acids as metabolite biomarkers for gallstone disease: a systematic review and meta-analysis. *PLoS One.* 2024;19(7):e0305170.
25. Kang GJ, Ewing-Nelson SR, Mackey L, Schlitt JT, Marathe A, Abbas KM, et al. Cholecystectomy and risk of metabolic syndrome. *Physiol Behav.* 2018;176(1):139-148.
26. D LP. The concept of cholelithiasis as per Ayurvedic text. *Int J Ayurvedic Med.* 2016;7(1):6-9.
27. Kumar D, Shirole P. Understanding cholelithiasis as per Ayurvedic text. *Glob J Res Anal.* 2021;10(4):23-26.
28. Lim LL, Scarborough JD, Thorne JE, et al. Primary sclerosing cholangitis and uveitis: a case series. *Am J Ophthalmol.* 2007;143(3):534-536. doi: 10.1016/j.ajo.2006.09.055.
29. PubMed. Nyctalopia due to severe liver cirrhosis-induced vitamin A deficiency [Internet]. [cited 2025 Sep 14]. Available from: <https://pubmed.ncbi.nlm.nih.gov/36728650/>

§§§