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A COMPARATIVE REVIEW OF AVASTHĀPĀKA AND MODERN GASTROINTESTINAL PHYSIOLOGY: BRIDGING TRADITIONAL AYURVEDIC CONCEPTS WITH BIOMEDICAL SCIENCE

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ABSTRACT In Āyurveda, digestion (āhāra pāka) is considered the ultimate cornerstone of health and systemic balance, divided into gastrointestinal macro-digestion (avasthāpaka) and tissue-level metabolism (nisthāpaka). Ancient texts describe avasthāpāka through changes in taste (rasa) over time. By connecting these stages to modern digestive physiology, we can understand these old clinical ideas better. This review looks at the three stages of avasthāpāka —madhura (sweet), amla (sour), and katu (pungent)—and compares them to what we now know about digestive juices, enzymes, and how the gut moves. By carefully studying old Ayurvedic texts like the Caraka Samhitā, Suśruta Samhitā, and Astānga H dayam , along with standard medical physiology books, a clear comparison framework appears. The first stage, madhura avasthāpāka, lines up well with how salivary amylase works and the early stages of food processing in the stomach. The amla avasthāpāka directly matches the stomach's acidity from hydrochloric acid and pepsin breakdown, followed by neutralization in the duodenum by pancreatic and bile fluids. Lastly, the katu avasthāpāka accurately describes the large intestine's functions, where water is reabsorbed, waste is compacted, and bacterial fermentation produces gases. Overall, the stages of avasthāpāka described by ancient scholars show clear links to the biochemical changes recognized in modern medicine, suggesting that traditional Ayurvedic gastroenterology has real physiological relevance.

KEYWORDS : Avasthāpāka, Jatharāgni, Gastrointestinal Physiology, Gastric Acid, Digestion.

INTRODUCTION

Ayurveda's approach to health is based on three main pillars: ahara (food), nidra (sleep), and brahmacarya (restraint or controlled vitality). Food is considered the most important because it's what keeps us alive. Our body tissues can't grow or maintain themselves if food isn't properly processed by Agni. When digestion doesn't work right, it creates ama, a toxic waste product that improperly metabolized, which is seen as the main cause of many illnesses [5].

So, ahara paka (digestion and assimilation) is really important for health and medical treatment. Ayurvedic physiology breaks this process into two connected stages: avasthapaka and nisthapaka [1, 3].

The avasthapaka process happens in three distinct stages in the digestive tract: madhura, amla, and katu avasthapaka. It starts with bodhaka kapha, which makes food easier to swallow. Then, with the movement of pran a vayu, the food goes to the stomach. In the stomach, kledaka kapha softens and liquefies the food, getting it ready for the enzymes from pacaka agni, which is controlled by samana vayu [1, 4].

Even though normal food has all six tastes (rasas), the initial breakdown makes the food mainly taste sweet (madhura). This stage creates a frothy type of kapha, which is why it's called madhura avasthapaka. As food moves further down, it undergoes more chemical changes and becomes acidic or amla (amla avasthapaka), which naturally leads to the production of pitta. Finally, when the leftover material leaves the stomach and goes into the lower intestines, it loses fluids, becomes solid, turns pungent (katu), and triggers the local generation of vata. This last stage is called katu avasthāpāka [1, 2, 3].

AIMS AND OBJECTIVES

- To examine the ideas behind avasthapaka in classical Ayurvedic texts.
- To compare these traditional stages with our current understanding of digestive juices, enzymes, and gut movement.

MATERIALS AND METHODS

This study involved a thorough review of classic Ayurvedic writings, mainly the Caraka Samhita, Susruta Samhita, and Astanga Hr dayam, along with their traditional commentaries . We collected and analysed references describing the stages of digestion. To create a reliable comparison, these concepts were studied using standard medical physiology and anatomy textbooks, as well as recent research papers.

DISCUSSION

Digestion is the process of breaking down large, complex food molecules into smaller, water-soluble components that can be absorbed into the bloodstream through the intestinal wall [6]. It starts in the mouth with chewing and saliva. Saliva, produced by salivary glands, is mostly water, mucus, and salivary amylase (ptyalin). Ptyalin breaks down starches into simpler sugars like maltose and dextrin [6, 7].

After swallowing, the food reaches the stomach and mixes with gastric juice. The main components of gastric juice are hydrochloric acid, secreted by parietal cells, andpepsinogen, secreted by chief cells. The high acidity turns inactive pepsinogen into active pepsin, which breaks down proteins into smaller peptides [6, 7].

When this acidic mixture (chyme) enters the duodenum, it triggers the release of secretions from the pancreas and liver [6]. The pancreas releases an alkaline fluid rich in bicarbonat e ions and enzymes like trypsinogen, chymotrypsinogen, amylase, and lipase. At the same time, the liver produces bile, stored in the gallbladder, which contains bile salts that help emulsify fats, making them water-soluble. The bicarbonate in pancreatic juice neutralizes the stomach acid, raising the pH to a level where pancreatic enzymes can work effectively [6, 8].

The final chemical digestion is carried out by intestinal juice, produced by cells in the intestinal lining. An enzyme called enterokinase activates trypsinogen into trypsin, which then activates other protein-digesting enzymes. Enzymes in the brush border break down nutrients into amino acids, fatty acids, and monosaccharides for absorption. Any remaining undigested material moves into the colon, where it's compacted and eliminated [6, 7, 8].

Analysis Of Avasthapaka In The Light Of Physicology Of Digestion

Madhura Avasthapaka

The first part of avasthapaka happens in the mouth and the upper part of the stomach. Bodhaka kapha's role is similar to saliva, providing the moisture needed to dissolve food so it can interact with taste receptors. While early Ayurvedic texts don't focus much on salivary breakdown, later works mention the enzymatic properties of saliva. Food then enters the upper stomach, guided by prana vata. Here, mucus secretions from the stomach lining (kledaka kapha) coat the food, protecting the stomach and helping digestive enzymes work. Because starch digestion by ptyalin produces sweet-tasting maltose and dextrins, the food mixture at this stage becomes noticeably sweet (madhura), reflecting the dominance of earth and water elements [1, 2, 9].

Amla Avasthapaka

As food moves into the main part of the stomach, the process becomes acidic. Kledaka kapha acts as a protective layer, shielding the stomach lining from the acidic gastric juices. Driven by samana vayu, the digestive fire (pacaka pitta) stimulates significant secretion. In modern terms, this matches the gastric phase of secretion [6]. Caraka noted that as this acidic mass leaves the stomach and enters the duodenum, accha pitta secretion occurs [1, 3]. Accha pitta can be seen as the digestive secretions entering the duodenum, including bile and pancreatic juice [6, 8].

Katu Avasthapaka

The final stage takes place in the colon. Here, the undigested material has water and electrolytes reabsorbed through the colon wall, turning the remaining liquid into solid feces [6, 8]. The shift to a pungent or acrid (katu) state is linked to the biochemical activity of the dense colonic bacteria [10]. These anaerobic bacteria ferment undigested amino acids and carbohydrates, producing gases like hydrogen sulfide and ammonia, as well as indole and phenols. The production of these acrid gases provides a scientific parallel to the traditional idea that katu avasthāpāka leads to the generation of vāta [1, 10].

Table 1: Comparative mapping of avasthāpāka stages and modern physiological correlates.

Stage of Avasthāpāka	Anatomical Site	Approximate Modern Physiological Correlate	Major Physiological/Biochemical Events
Madhura Avasthāpāka	*Mukha & Ūrdhva Āmāśaya*	Oral phase and early gastric storage	Mastication and salivary secretion initiate starch digestion through salivary amylase, forming a lubricated bolus [6].
Amla Avasthāpāka	*Āmāśaya & Grahaṇī*	Gastric phase and early intestinal phase	Gastric HCl and pepsin promote protein digestion and acidification; buffering and neutralization begin in the duodenum [6, 7].
Kaṭu Avasthāpāka	*Pakvāśaya*	Colonic phase	Water and electrolyte reabsorption occur alongside microbial fermentation, producing SCFAs and facilitating fecal formation [6, 10].

LIMITATIONS

The connections made in this review are based on interpretation and aim to help compare Ayurvedic and modern medical frameworks. Ayurvedic concepts like avasthāpāka come from a different theoretical system and shouldn't be seen as exact equivalents of modern digestive processes. Therefore, these interpretations are still theoretical and need more research. Further studies are needed to explore and confirm the proposed links [6, 10].

CONCLUSION

A detailed comparative review shows that the ancient Ayurvedic concept of avasthāpāka can be meaningfully compared with modern digestive physiology. Madhura avasthāpāka aligns with chewing and early stomach digestion, amla avasthāpāka corresponds to digestion by stomach acid and enzymes, and katu avasthāpāka reflects colon fermentation and the formation of feces. These correlations indicate that the functional and observational insights of ancient Ayurvedic practitioners are closely related to modern biochemical processes [6, 7, 10].

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REFERENCES

1. Acharya, Y. T. (Ed.). (2013). *Charaka Saṃhitā of Agniveśa* Sūtrasthāna, Chapter 28. Chowkhamba Surabharati Prakashan.
2. Paradkar, H. S. (Ed.). (2012). *Aṣṭāṅga Hṛdayam of Vāgbhaṭa* Sūtrasthāna, Chapter 9. Chowkhamba Sanskrit Sansthan.
3. Acharya, Y. T. (Ed.). (2013). *Charaka Saṃhitā of Agniveśa* Sūtrasthāna, Chapter 25, Verse 40. Chowkhamba Surabharati Prakashan.
4. Sharma, S. (Ed.). (2011). *Aṣṭāṅga Saṅgraha of Vṛddha Vāgbhaṭa* Sūtrasthāna, Chapter 9. Chowkhamba Sanskrit Series Office.
5. Srikantadatta (Ed.). (2014). *Mādhava Nidāna of Mādhava-kara* Chapter 6. Chowkhamba Prakashan.
6. Hall, J. E., & Hall, M. E. (2021). *Guyton and Hall textbook of medical physiology* 14th ed., Unit 4: Gastrointestinal physiology. Elsevier.
7. Barrett, K. E., Barman, S. M., Brooks, H. L., & Yuan, J. X. (2019). *Ganong's review of medical physiology* .26th ed., Section 4: Gastrointestinal physiology. McGraw-Hill.
8. Standring, S. (Ed.). (2021). *Gray's anatomy: The anatomical basis of clinical practice* (42nd ed., Section 5: Abdomen). Elsevier.
9. Yogananda Sūtram with Yogananda Bhāṣyam Chapter 1.
10. The Human Microbiome Project Consortium. (2012). Structure, function and diversity of the healthy human microbiome. *Nature*, *486*(7402), 207–214.