

Bio-Transformatory Factors Of Ayurveda In Prevention Of Functional Gastrointestinal Disorders (Fgids) - A Narrative Review

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ABSTRACT:

Background: Ayurveda emphasizes three sub-pillars for the sustenance of life: Ahara (diet), Nidra (sleep), and Brahmacharya (celibacy). Among these, Ahara is considered fundamental for maintaining strength, complexion, tissue nourishment, digestive power, and overall physiological balance. Proper digestion, absorption, and metabolism of food are regulated by six bio-transformative factors collectively known as Aharaparinamakarahavas: Ushma, Vayu, Sneha, Kleda, Kala, and Samayoga. Disturbance in these factors may impair gastrointestinal physiology and contribute to Functional Gastrointestinal Disorders (FGIDs). Aim: To critically analyse the concept of Aharaparinamakarahavas and evaluate their role in the prevention and pathophysiology of Functional Gastrointestinal Disorders. Materials and Methods: Classical Ayurvedic texts were reviewed along with contemporary medical literature, peer-reviewed journals, PubMed, J-Gate, and Google Scholar databases Using Boolean operators between Keyword. Results and Conclusion: Aharaparinamakarahavas represent fundamental bio-regulatory mechanisms responsible for maintaining gastrointestinal homeostasis. Imbalance in Ushma, Vayu, Sneha, Kleda, Kala, and Samayoga may impair gut physiology without structural pathology and contribute to the development of FGIDs. Proper dietary regulation and maintenance of these factors play a significant role in preserving gut health and preventing functional gastrointestinal and lifestyle-related disorders..

Keywords: Ayurveda, Aharaparinamakarahava, FGID (Functional gastrointestinal disorders), Biotransformation..

INTRODUCTION

To live is to be nourished, without food surveillance and biological function become inert, Ayurveda emphasis on three sub pillars for sustain of life wise Ahara (Diet), Nidra (Sleep) and Bramhacharaya (Celibacy)¹. Ahara will impact on Bala (Strength), Varna (Complexion), Upachaya of Dathu (Tissue development), Agni (Digestive fire) and almost all physiological components. Proper diet maintenance will retain health and prevents diseases hence Ahara termed as Mahabhaishajya² (Supreme medicine) and it considered equivale importance with Prana (Vitality). The food ingested to be properly digested, absorbed and metabolised then only we will get vitality, this sustainment will be regulated by some factors in the body coined by the word Ahraparinamakarahavas (Bio-transformatory factors of diet).

Aharaparinamakarahavas (Bio-transformatory factors of diet)

Aharaparinamakara bhavas are the biological factors which influence the Digestion, Absorption and Metabolism, these are six in number viz, Ushma (Warmth), Vayu (Air), Sneha (Unctuous), Kleda (Moisture), Kala (Time) and Samayoga (Conjunction)³.

USHMA

The term Ushma signifies the potency of Hot or warm, which is the primary aid for bioconversion. Agni (Digestive fire) is regarded as moderator for this action comprises of Kostagni (Digestive fire in Gastrointestinal tract-GIT), Sapthadathvagni (Digestive fire of Seven tissues) and Panchabhutahagni (Digestive fire in Cellular level). The Ushma defined as Usmam pachati⁴ denotes digestion of ingested food, the function is primarily driven by Agni and parallel contribution of Pachakapitta.

VAYU

Vayu is the Vital force which governs every component of the body, in the context of digestion the Vayu plays crucial role in movements of the ingested materials. Vayurapakarshati means to supply the food components to Agni for transformation after ingestion⁵. Pranavata will do the role of Annapraveshana (Food ingestion) can be considered as the supply of Ahara from ingestion to the Agni's Location, i.e. Kosta (Gut).

SNEHA- The appropriate quantity of Sneha will trigger the metabolic function by increment in the digestive fire⁶. The Sneha in the gut will make food soften hence enhances the absorption. The lubrication of the gut flora is maintained results in proper peristalsis also. Disruption in the Sneha guna will disrupt the digestive function and excessive may hamper the Agni and lack of Sneha may irritate the Gut flora.

KLEDA- The Kleda reflects Kledakakapha and plays crucial role in disintegrating crude food into biological absorptive form. The integrity of the food should be detached so the active molecule will be expressed for transformation. The action of Kleda starts from mouth itself helps in formation of the Bolus and easy movement through mucosal linings.

KALA- The retention of the food in the several sites of the GIT tract is most essential for the digestion and absorption, Ayurveda given vital role for the time factor and key factor for Pakanishpattim⁷ (Transformation) means to complete transformation of the Macromolecules of food to biochemical absorptive form.

SAMYOGA

The term Samayoga indicates conjunction of the ideal maintain in Prakruthi (Nature of food), Karana (Processing), Samyoga (Combination), Desha (Geographical region), Rasi (Quantity), Kala (Time), Upayogasatha (Dietic rules and Regulations), Upayogakatra (Individual). This results in regulation of homeostasis in the Dathu's and hence the digestive power and other attributes of the Digestion will be enhanced and prevents various kinds of enteropathy.

FUNCTIONAL GASTROINTESTINAL DISORDERS (FGIDS)

The chronic pathological conditions like IBS, Functional Dyspepsia, Constipation etc. with recurring gastrointestinal symptoms like Pain, Discomfort, Bloating, Diarrhoea without any structural damage in mucosal cellular components of the gut. FGID's most of the time results due to impairment in Gut-Brain Axis and significantly affects the Quality of life. About 40% of the global population suffering from FGID's particularly 11.7% with functional constipation, 7.2% with functional dyspepsia, 4.1% with IBS, 4.7% with functional diarrhoea, 3.5% with bloating and distension, 3.2% with functional dysphagia etc⁸.

Aim and Objectives

The aims and objectives of the study are to critically study and analyse the importance of "Aharaparinamakrabhavas (bio-transformatory factors of diet) and their role in prevention of functional gastrointestinal disorders.

Materials and Methods:

Ayurvedic literature includes Charaka Samhita, Astangahridaya, Astanga Sangraha, Sushruta Samhita, Shrarangdhara Samhita and Harita Samhita of Ayurveda, Modern literature, contemporary texts, peer reviewed journals, Pub med, J-gate, Google scholar etc. The Boolean operators AND, OR used between Ahara AND FGID'S, Transformation and Absorption AND Ayurveda regimens and websites related to Food, its digestion, absorption and metabolism and pathophysiology were studied.

Results

Aharaparinamakrabhavas are the physiological entities regulates the Digestion, Absorption and Metabolism. These factors mimic the function of Various Gastrointestinal Hormones and enzymes and supportive entities like Gut brain axis, MALT and Gut Biome. Derangement in these factors will dysregulate the Pachanakriya (Physiology of Digestion). Most of the Functional gastrointestinal disorders (FGID's) are due to disproportionalities in the Aharaparinamakrabhavas and their physiological balance prevents (FGID's).

Discussion

Aharaparinamakrabhava can be understood from Macro and Micro digestion levels, classics highlighted the influence of these factors in gastrointestinal tract, this physiology can be discussed from tissue and cellular bioconversion level also.

Biotransformation and Usma

The wellbeing of the body is regulated by building blocks of the nutrition wise Carbohydrate, Protein and Lipids consumed routinely in the form food⁹. The diet which is ingested will be in the Macro form and it has been converted into biological absorptive form as Glucose, Amino acids and Fatty acids. The Bioconversion is Carried out by Agni. The Ushma Guna of Agni and Pachakapitta acts on diet so that, potential energy in the form of chemical bonds turns to kinetic hence enhances the oxidation potential results in Biotransformation. This process is called as Pachana by Usma Quality. If fails in this conversion Liberates free radicals leads to production of Indigestible results in functional Dyspepsia.

Enteric plexus and Vayu

The complex of Neurons controls the gastrointestinal tract comprises of two main branches are Misener plexus and Auerbach plexus¹⁰. The deglutition reflux involved in the swallowing of Bolus can be correlated to Pranavata function, other movements of GIT is enhanced by Samana and Vyanavata hence can be co related to Auerbach plexus. The derangement in the function of Vata dosha directly influence on the enteric system and most of the time patients suffer from functional Bloating, Constipation and discomfort are without any pathological findings on radiological investigation and not treated for long time chronicity of symptoms may results in intussusception, Volvulus, Herniation and Paralytic Ilus¹¹.

Mucosal lining of GIT and Sneha

Gut Health a novel concept emerged composed of three components, the Diet, Mucosa and Commensal flora. The mucosa component elaborated in terms of Sneha and emphasizes the symbiotic relation. Snehanam snehavisyandyam mardhavam kledakarakam¹² stated by Acharya Charaka and elaborates maintain of equilibrium of fluid and floral integrity. Gastrointestinal epithelial mucosal lining plays vital role in symbiosis, the highly glycosylated complex protein quaternary structure stabilised by disulfide bond liberated from this layer called as Mucin produced from Paneth cells, Enterocyte and Goblet cells releases¹³. The entities Mucosa mentioned in the contemporary science and Sneha concepts of APB are reflections.

Hydrolysis and Kleda

Kleda acts as Solvent for Water soluble molecules which are ingested and facilitates enzymatic actions. The water balance and ion balance of gut is enhanced by microbiota, Bifidobacterium, Lactobacillus plays vital role in maintains of ion water balance by producing short chain of fatty acid from the undigested carbohydrate and hence this action can be understood under the headline of Kleda. Molecular level variation of Kleda results in Hypertonicity and Hypotonicity, this concentration will influence the Gastric emptying and functional Constipation Diarrhoea¹⁴.

Sneha and Kleda in the form of Kledakakapha together part of Immune response reflects the function of Mucosa-associated lymphoid tissue (MALT). Vital role to capture antigens and initiate immune responses against pathogens.

Entero-Neuro-regulation and Kala- The proper regulation of time impacts significantly on the Gut Health, Samnavata and its functions details the function of Enteric nervous system, The initiation of hunger and its satisfaction will well be regulated by Samanavata. The Interaction of Samanavata and Pranavata can be correlated to Entero-Neuro-Regulation. The feeding centre and satiety centre are responsible for the regulation of food intake¹⁵, digestion and further assimilation are key controlled by Kala. The dosha have biological rhythms and continuously regulated gastrointestinal functions. The variation may lead to free radical liberations, dysmotility, Functional Constipation and Dumping Syndrome.

Lifestyle and Samayoga

The dietic rules and regulation, includes current lifestyle, Nutritive value of the food, modality of consumption all together impacting the health status of the present era. The environmental hazardous factors also impacting the health and hence nowadays lifestyle disorders are the major challenges in the health sector. The Samayog principle of ayurvedic deictic regulation are the key solution for this dangerous situation.

CONCLUSION

Aharaparinamakrabhav's are fundamentally physiological entities significantly takes role in the Digestion, Absorption and Metabolism of food. The variation in these factors can't be identified as structural defects in the Gut but impairs the normal function of all the parameters related to Gut micro biome. The derangement in Ushma, Vayu, Sneha, Kleda, Kala and Samayoga impacts on Gut brain axis, Entero-Neuro regulation, potentials of Biotransformation, MALT, Secretion of Mucosa and ends up with Functional gastrointestinal disorders (FGID's). The Diatic rules and regulation and balanced Aharaparinamakrabhavas emphasis the maintains of healthy gut and prevention of various lifestyle disorders, non-communicable disorders and particularly FGID's

REFERENCES

1. Acharya YT, Charaka Samhita of Agnivesha, Sutra Sthana. Ch. 11, Ver. 35. 2nd ed. Varanasi: Chaukhamba Orientalia; 2006. p. 116.
2. Acharya YT, Charaka Samhita of Agnivesha, Sutra Sthana. Ch. 26, Ver. 85. 2nd ed. Varanasi: Chaukhamba Orientalia; 2006. p. 116.
3. Chacko N, Lakshmy A K N, Ajitha K, Sivaram A, Pradeep K, Abhilash M, Panthappulan H, Sumi S. Ahara parinamakara Bhavas -A key to health. Kerala Journal of Ayurveda. 2024; 3(1): 38-43. <https://doi.org/10.55718/kja.249>ARTICLE HISTORY

4. Acharya YT, editor. Sushruta Samhita of Sushruta, Sharira Sthana. Ch. 2, Ver. 3. Reprint edition. Varanasi: Chaukhamba Orientalia; 2014. p. 344.
5. Saylee Deshmukh, Vyas M K, Bhushan Sanghavi (2015), Concept of Ahara parinamakarabhava in context to lifestyle, Global J Res. Med. Plants & Indigen. Med., Volume 4(5): 106–110
6. Acharya YT, editor. Sushruta Samhita of Sushruta, Sharira Sthana. Ch. 13, Ver. 12. Reprint edition. Varanasi: Chaukhamba Orientalia; 2014. p. 344
7. Acharya YT, Charaka Samhita of Agnivesha, Sutra Sthana. Ch. 26, Ver. 85. 2nd ed. Varanasi: Chaukhamba Orientalia; 2006. p. 116.
8. Sperber AD et al. Worldwide Prevalence and Burden of Functional Gastrointestinal Disorders, Results of Rome Foundation Global Study. Gastroenterology. 2021 Jan;160(1):99-114.e3. doi: 10.1053/j.gastro.2020.04.014. Epub 2020 Apr 12. PMID: 32294476.
9. Morris AL, Mohiuddin SS. Biochemistry, Nutrients. [Updated 2023 May 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK554545>
10. Sembulingam K. Essentials of Medical Physiology. 6th ed., Ch. 36. Delhi: Jaypee Brothers Medical Publishers; 2016. p.220
11. Weledji EP. Perspectives on paralytic ileus. Acute Med Surg. 2020 Oct 4;7(1):e573. doi: 10.1002/ams2.573. PMID: 33024568; PMCID: PMC7533151.
12. Acharya YT, Charaka Samhita of Agnivesha, Sutra Sthana. Ch. 22, Ver. 11. 2nd ed. Varanasi: Chaukhamba Orientalia; 2006. p. 116.
13. Hansson GC. Mucins and the Microbiome. Annu Rev Biochem. 2020 Jun 20;89:769-793. doi: 10.1146/annurev-biochem-011520-105053. Epub 2020 Apr 3. PMID: 32243763; PMCID: PMC8442341.
14. Sato K, Hara-Chikuma M, Yasui M, Inoue J, Kim YG. Sufficient water intake maintains the gut microbiota and immune homeostasis and promotes pathogen elimination. iScience. 2024 May 3;27(6):109903. doi: 10.1016/j.isci.2024.109903. PMID: 38799550; PMCID: PMC11126815.
15. Ahima RS, Antwi DA. Brain regulation of appetite and satiety. Endocrinol Metab Clin North Am. 2008 Dec;37(4):811-23. doi: 10.1016/j.ecl.2008.08.005. PMID: 19026933; PMCID: PMC2710609.