



Review Article

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NON-PHARMACOLOGICAL MANAGEMENT OF FUNCTIONAL GASTROINTESTINAL DISORDERS THROUGH AYURVEDA: A REVIEW

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ABSTRACT

Non-pharmacological management refers to the management without the use of medications. Gastrointestinal disorders, especially Functional Gastrointestinal Disorders (FGIDs), are common disorders characterized by persistent and recurrent gastrointestinal symptoms due to abnormal functioning of the enteric nervous system where no structural or organic pathology is identified. FGIDs are associated with motility disturbances, visceral hypersensitivity, altered mucosal and immune function, gut microbiota, etc. To fully understand the pathophysiology of FGIDs, it is important to comprehend the biopsychosocial behaviour, which focuses on understanding and treatment of the illness and the subjective sense of the patient's suffering. Globally, the most common FGIDs (irritable bowel syndrome and functional dyspepsia) alone affect 16–26% of the population. The non-pharmacological management includes reassurance, lifestyle modifications including observance of dinacharya (daily regimen), gut hygiene, ritucharya (seasonal regimen), psychotherapy, dietary interventions like intake of pathyaahara, implementing sadvritta, the ideal code of conduct, performing yoga, etc. Since gastrointestinal disorders are highly prevalent and pharmacological modalities are limited in contemporary medicine. Thus, a non-pharmacological approach can be preferred in today's era for sustainable results. Ayurveda follows a holistic approach and has never considered an individual's physical, physiological, and psychological aspects as separate entities. Hence, the management of different diseases has been given under three modalities: daivavyapashraya, yuktivyapashraya, and satvavajaya chikitsa. Thus, in the non-pharmacological management of FGIDs, Ayurveda played a magnificent role.

Keywords: FGIDs, Functional Dyspepsia, Irritable Bowel Syndrome, Non-pharmacological management, Satvavajaya Chikitsa, Sadvritta.

INTRODUCTION

Ayurveda follows a holistic approach and has never considered an individual's physical, physiological, and psychological aspects as separate entities. Hence, the management of different diseases has been given under three modalities as daivavyapashraya chikitsa (divine therapy), yuktivyapashraya chikitsa (rational therapy), and satvavajaya chikitsa (psychotherapy)¹. Non-pharmacological management is the management without medications that can be correlated to adavyabhuta chikitsa. This treatment modality aims at physical, mental, and spiritual well-being and treats diseases of the body, mind, and soul. This modality doesn't involve the administration of any kind of medication. The non-pharmacological management includes reassurance, lifestyle modifications including observance of dinacharya, gut hygiene, ritucharya, psychotherapy, dietary interventions like intake of pathyaahara, implementing sadvritta (the ideal code of conduct), achara rasayana (behavioural conduct) performing yoga, etc.

Functional Gastrointestinal Disorders (FGIDs) are common disorders characterized by persistent and recurrent gastrointestinal symptoms due to abnormal functioning of the enteric nervous system where no structural or organic pathology is identified. FGIDs are associated with motility disturbances, visceral hypersensitivity, altered mucosal and immune function, and brain-gut dysfunction. FGIDs are important for public health

because they are highly prevalent, induce significant social and economic burdens, and are associated with impaired health-related quality of life. Globally, the most common FGIDs, i.e., irritable bowel syndrome (IBS) and functional dyspepsia (FD), alone affect 16–26% of the population. The pharmacological management of FGIDs is limited in contemporary medicine and has poor symptom control for many patients. Thus, non-pharmacological management is preferred more in today's era. To fully understand the pathophysiology of FGIDs, it is essential to comprehend the biopsychosocial behaviour, which focuses on understanding and treatment of the illness and the patient's subjective sense of suffering. Non-pharmacological management includes lifestyle interventions, dietary interventions, behavioural interventions, etc.

FGIDs

A functional disorder is an ongoing problem with bodily functions that physical causes can't explain. Gastrointestinal diseases are often functional rather than structural. Functional gastrointestinal disorders (FGIDs), now called disorders of gut-brain interaction (DGBIs), have major economic effects on healthcare systems and adversely affect the quality of life (QOL). The most common FGIDs are irritable bowel syndrome (IBS) and functional dyspepsia (FD). The disorders of gut-brain interactions (DGBIs) are diagnosed based on Rome's foundation diagnosis criteria. This was started with Rome I (1994), Rome II (2000),

Rome III (2006), and Rome IV (2016), and Rome V will be completed by 2026.

Irritable Bowel Syndrome (IBS)

Irritable bowel syndrome (IBS), also known as the spastic or nervous colon and spastic bowel, is a functional gastrointestinal illness defined by a collection of symptoms, including stomach pain and alterations in the consistency of bowel movements. These symptoms develop gradually over many years, frequently. According to the updated ROME III criteria, IBS is a clinical diagnosis and presents as one of the three predominant subtypes:

1. IBS with constipation (IBS-C)
2. IBS with diarrhoea (IBS-D); and
3. Mixed IBS (IBS-M).

Former ROME definitions refer to IBS-M as alternating IBS (IBS-A). Across the IBS subtypes, the presentation of symptoms may vary among patients and change over time.² IBS has a detrimental effect on the quality of life. People with IBS frequently suffer from disorders like anxiety, significant depression, and chronic fatigue syndrome. The causes of IBS are not clear. Theories include combinations of gut-brain axis problems, gut motility disorders, pain sensitivity, infections including small intestinal bacterial overgrowth, neurotransmitters, genetic factors, and food sensitivity. An intestinal infection or stressful life event may trigger the onset. IBS has no known treatment. The main focus of the entire treatment is just to reduce symptoms which may involve dietary adjustments, medication, probiotics, and counselling.

Rome IV - Diagnostic Criteria for Irritable Bowel Syndrome³

1. Abdominal pain at least 4 days per month associated with one or more of the following:
 - a. Related to defecation.
 - b. A change in frequency of stool
 - c. A change in the form (appearance) of stool
2. In children with abdominal pain and constipation, the pain does not resolve with resolution of constipation (children in whom the pain resolves have functional constipation, not IBS).
3. After appropriate evaluation, another medical condition cannot fully explain the symptoms.

The aforementioned criteria should be fulfilled at least 2 months before diagnosis.

Functional Dyspepsia (FD)

Functional dyspepsia is considered one of the most common functional disorders. It is sometimes referred to as non-ulcer dyspepsia or indigestion. Its symptoms include epigastric pain, bloated stomach, early satiety or loss of appetite, heartburn, acid reflux, nausea, and vomiting. FD is classified into two subtypes based on the symptoms: Epigastric Pain Syndrome (EPS) and Postprandial Distress Syndrome (PDS). EPS refers to only those symptoms associated with upper abdominal pain and burning. PDS refers to symptoms after eating, such as early fullness, bloating, and nausea. The pathology of the disease is unclear, but some of the assumed causes are impaired stomach emptying and accommodation, food allergies, H. pylori infections, and visceral hypersensitivity. The risk factors of FD include having H/o depression or anxiety, H/o H. pylori infection, use of NSAIDs, etc. The treatment consists of dietary management, behavioural therapy, diet changes, and lifestyle modifications.

Rome IV - Diagnostic Criteria for Functional Dyspepsia⁴

1. One or more of the following:
 - a. Bothersome postprandial fullness
 - b. Bothersome early satiety
 - c. Bothersome epigastric pain
 - d. Bothersome epigastric burning

2. No evidence of structural disease found on performing upper endoscopy that is likely to explain the symptoms.

Criteria fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis.

IBS vs FD

The differences between IBS and FD are enlisted in Table 1.

Table 1: Differences between IBS and FD

Features	Irritable Bowel Syndrome (IBS)	Functional Dyspepsia (FD)
Common Name	Nervous Stomach	Irritable Stomach Syndrome
Site of involvement	Large intestine or colon	Stomach and upper small intestine
Character of pain	Cramping pain in the bowels due to constipation or diarrhoea	Burning sensation in the upper GI tract

FGIDs in Ayurveda

The prevalence of IBS in the world has been estimated to be 11.2%, and in India, it is about 4.2%-7.7%. It is 3 times more common in women and people of working age.⁵ IBS closely resembles Grahani, a condition described under astha mahagada by Acharya Vagbhata.⁶ The common etiologies of Grahani are ajirna (indigestion), vishamashana (irregular food habits), incompatibility of desha (place), kala (time) and ritu (season), vegadharana (suppression of urges), etc.⁷ Grahani and agni (digestive fire) are interdependent. Functionally, weak agni, i.e., mandagni, causes improper digestion of ingested food leading to ama dosha, which has a vital role in the pathogenesis of Grahani roga.⁸ It is said that wholesome food taken even in proper quantity does not get adequately digested when the individual is afflicted with grief, fear, anger, sorrow, excessive sleep, and excessive vigil. Passion, anger, greed, confusion, envy, bashfulness, grief, indigestion, anxiety, and fear will end up in amapradoshaja vikara (disorders due to undigested food). The mind is crucial in all forms of IBS. Anxiety and stress increase awareness of colon spasms in mind. The gut microbiota is a critical component of the gut-brain. According to gut-brain psychology, gut microbiota communicates with the brain via the microbiota-gut-brain axis. The pathophysiology of many mental and neurological illnesses is influenced by the gut microbiota, which also impacts various normal cognitive processes and mental phenomena. The microbiota in the intestine starts to disappear as a result of numerous stress factors, poor diet, and lifestyle choices, which will lead to various diseases, including IBS.⁹

Worldwide functional dyspepsia (FD) prevalence varies between 7-45 %. The prevalence of FD has been noted to range between 11-29 % in India. Population-based estimates of Functional Dyspepsia in India are sparse. A study in Mumbai, India, showed that almost a third of the population suffered from dyspepsia (30.4%), with 12 % experiencing significant symptoms.¹⁰ In Ayurveda, dyspepsia bears a close resemblance to Amlapitta.¹¹ It is a clinical entity of the upper gastrointestinal tract caused due to pathological condition of Pitta. Functional dyspepsia has more close resemblance with Urdhvagata Amlapitta. Features of Urdhvagata Amlapitta are vomiting that occurs during digestion or even on an empty stomach with a bitter or sour taste, belching, and burning sensation in the throat, chest, and upper stomach.

Utility of Adravyabhuta Chikitsa

Satvavajaya chikitsa (psychotherapy) is a non-pharmacological approach to controlling the mind by refraining from unpleasant things.¹² This can be achieved by five methods which are jnana (spiritual knowledge), vijnana (scriptural knowledge), dhairya (patience), smrti (memory), and samaadhi¹³ (meditation), which are related to adravyabhuta chikitsa (Non-pharmacological management).¹⁴

Many such references are found in the context of adravyabhuta chikitsa of different diseases in Ayurveda. Upavasa (fasting) is the main adravyabhuta chikitsa in Grahani (sprue), likewise ashvasana (assurance) in Bhayaja Atisara (diarrhoea caused by fear) and harshana (excitement) in Shokaja Atisara (diarrhoea caused by the grief). Similarly, manoanukula vakya (telling pleasant statement), ashvasana (assurance), harshana

(excitement), and hitaahara-vihara (providing suitable food and activities) are indicated in Chardi (vomiting).¹⁵

Ayurveda has outlined several guidelines and routines (charya) on diet and behaviour to help people adapt to seasonal changes without disrupting their body's balance. The primary goal of the Ayurvedic medical system is prevention which can be accomplished by altering one's food and lifestyle in relation to climatic changes. According to Ayurvedic scriptures, this is a crucial component of preventive treatment.

Rationale followed during different seasons

The changes in the rasa, mahabhuta, status of dosha and agni bala are depicted in Table 2.¹⁶

The wholesome and unwholesome methods followed in different ritu (seasons) are depicted in Table 3.

Table 2: Changes based on Ritu

Ritu	Predominant Rasa	Predominant Mahabhuta	Status of Dosha	Agni Bala
Shishira	Tikta	Vayu and Akasha	Kapha Accumulation	Agni gets enhanced
Vasanta	Kashaya	Prithvi and Vayu	Kapha Vitiation	Agni in the mild stage
Grishma	Katu	Agni and Vayu	Vata Accumulation + Kapha Pacification	Agni remains in the mild stage
Varsha	Amla	Prithvi and Agni	Vata Vitiation + Pitta Accumulation	Agni gets decreased
Sharad	Lavana	Ap and Agni	Vata Pacification + Pitta Vitiation	Agni gets increased
Hemanta	Madhura	Prithvi and Ap	Pitta Pacification + Kapha Accumulation	Agni gets increased

Table 3: Wholesome and unwholesome foods according to Ritu

Ritu	Wholesome Foods	Unwholesome Foods
Shishira	Madhura, amla, lavana rasa, snigdha, and ushna guna dominant edibles	Katu, tikta, kashaya rasa, laghu, and sheeta guna predominant food items
Vasanta	Tikta, katu and kashaya rasa predominant food	Amla, madhura rasa, sheeta, snigdha, and guru guna predominant food
Grishma	Madhura, snigdha, sheeta, and drava guna dominant edibles	Lavana, katu, amla rasa, and ushna guna predominant food items
Varsha	Madhura, amla, lavana rasa, snigdha, ushna guna dominant edibles	Katu, tikta rasa and guru guna predominant bhojana
Sharad	Madhura, tikta, kashaya rasa, ruksha and sheeta guna dominant ahara	Kshara, guru bhojana, teekshna madhya
Hemanta	Madhura, amla, lavana rasa, snigdha, and ushna guna dominant edibles	Vatavardhaka ahara, laghu, sheeta, ruksha guna dominant bhojana

Dinacharya (Daily Regimen): Includes things that are mandatory to follow regularly to maintain a normal equilibrium of dosha, dhatu, mala, and agni. It also regularizes a person's biological clock and aids in food digestion, absorption, and assimilation.

Vyayama (Exercise)¹⁷ and Snana (Bath): Said to improve digestive capacity.¹⁸

Dantadhavana (cleaning of teeth), Jihwanirlekhana (cleaning of the tongue), and Tambula Sevana (chewing of betel leaf): Help in getting rid of mukhadaurgandha (halitosis), vairasya (faulty taste), and aruchi (tastelessness). It prevents dental caries by means of maintaining optimum salivary pH and promoting salivary secretion.¹⁹

Kavala (Gargling) and Gandusha (Buccal retention): Prevent mainly aruchi (tastelessness), mukhvairasya (faulty taste), daurgandha (halitosis), and lalasarava (excessive salivation).²⁰ When gandusha is done with lukewarm water, it gives the mouth the feeling of laghutva (lightness).²¹

Ushapana (Intake of water in the early morning): Prevents Arshas and Grahani. Copper and clay utensils are specified for ushapana. All the health advantages of copper were infused into

the water and left in a copper vessel overnight. Our stomach's ability to contract and relax is regulated by copper, making it easier for food to move quickly through the digestive system.¹⁹

Intake of appropriate Ahara (diet): Indicated as one of the integral components of the umbrella of dinacharya. Ahara is included as one of the trayopastambha (three sub-pillars). Ahara is one of the essential parts of life for preventing diseases and promoting health. A person should not follow vishmashana (untimely food) and adhyashana (food intake before digestion of previous food). It can hamper the digestive fire. Drinking water before meals reduce weight and decrease digestion, in the middle, increases digestive capacity, and in the end, causes obesity and increases Kapha.²²

Role of Yoga: It is essential for every physiological system's calm, effective, and harmonious functioning, especially the digestive system (annavaha srotas). Yogasana (Yoga postures) and pranayama (breathing exercises) are the methods employed in correcting sadhakagni and manas (mind). When sadhakagni has corrected automatically, the Prana Vayu, Udana Vayu, Samana Vayu, and other types of vayu will also get corrected. Vitiated form or uncontrolled actions of sadhakagni leads to prajnaparadha (intellectual blasphemy), which in turn afflicts all dosha of the body, thereby causing sarvadoshaprakopa (vitiating

of all Dosha). When dosha is in vitiated condition, they also lead to vitiation of agni. Hence control of Sadhaka Pitta or Sadhakagni, Prana Vayu, and Udana Vayu is necessary for maintaining the optimum state of agni in the human body, for which yoga and moksha are the two absolute ways.²³ Thus, Yogasana and pranayama procedures stimulate and strengthen agni, allowing it to maintain the human body's integrity. The commonly done yogasana is mayurasana (peacock pose), makarasana (crocodile pose), bhujangasana (cobra pose), matsyasana (fish pose), paschimottanasana (seated forward bend pose) and shavasana (corpse pose). Paschimottanasana gives pressure on the abdominal cavity and makes it easier for trapped gases to escape. These positions cool the back area of the body while heating the front. Yoga poses improve digestion by increasing blood flow to the digestive system and stimulating the peristalsis process in the intestine. Yoga also soothes the mind, which eases the body's digestive system and promotes more efficient evacuation.²⁴

Pranayama: The uchvasa (inspiration) and nishvasa (expiration) of Prana Vayu are involuntary activities. The procedure by which this involuntary activity is controlled

voluntarily is termed pranayama. Pranayama is very beneficial as it controls the mind and maintains the integrity of Agni.

Sadvritta: Means physical and mental decorum which should be followed by everyone daily which includes behavioural do's and don'ts, eating etiquettes, social rules, rules for study, havana karma, guidelines for chastity, etc.²⁵ Acharya Charaka has explained the importance of sadvritta as by following these rules one will lead a healthy life without suffering from any diseases. It also helps in attaining moksha (salvation). It can be taken to mean that a man can achieve all of his goals with a sound mind and body by adhering to these guidelines.²⁶

Acharya Rasayana (behavioural conduct): An explanation by Acharya Charaka is nothing but the code of right socio-behavioural conduct to be followed by definite methods to lead an ideal ethical way of living.²⁷ Such physical and behavioural conduct grace life with their rasayana effect. Acharya rasayana may act as a rasayana by improving and promoting all facets of health, viz. physical, mental personality, social and physical health.²⁶

PATHOPHYSIOLOGY

Pathophysiology of FGIDs

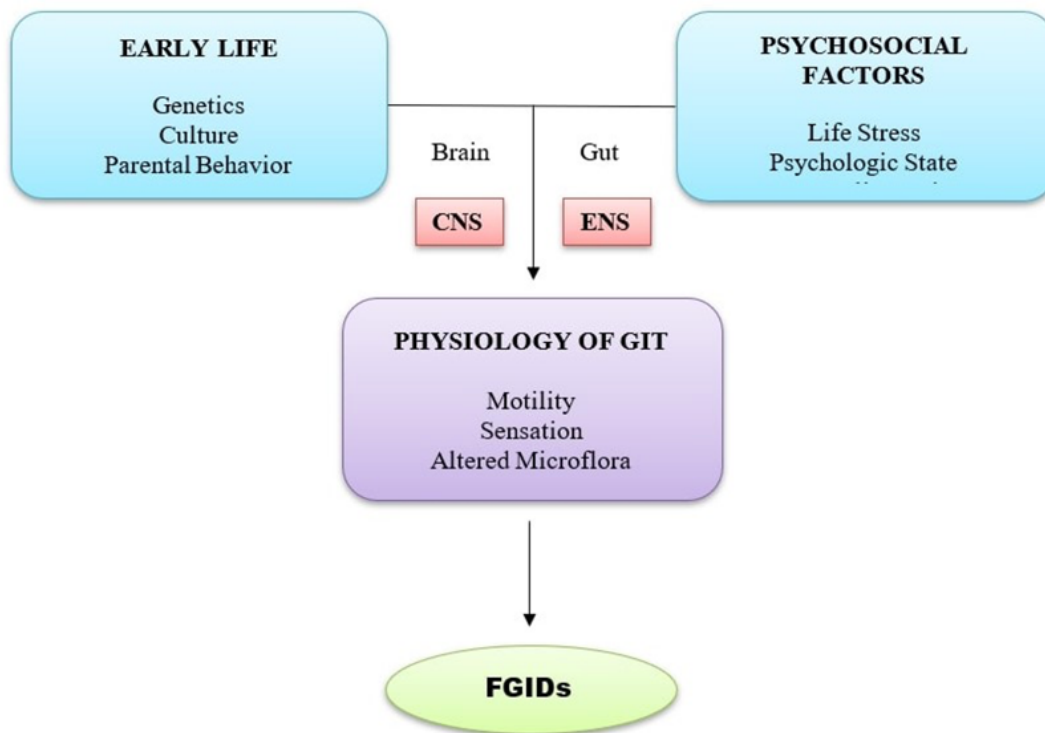


Figure 1: Pathophysiology of FGIDs

Pathophysiology of Grahani

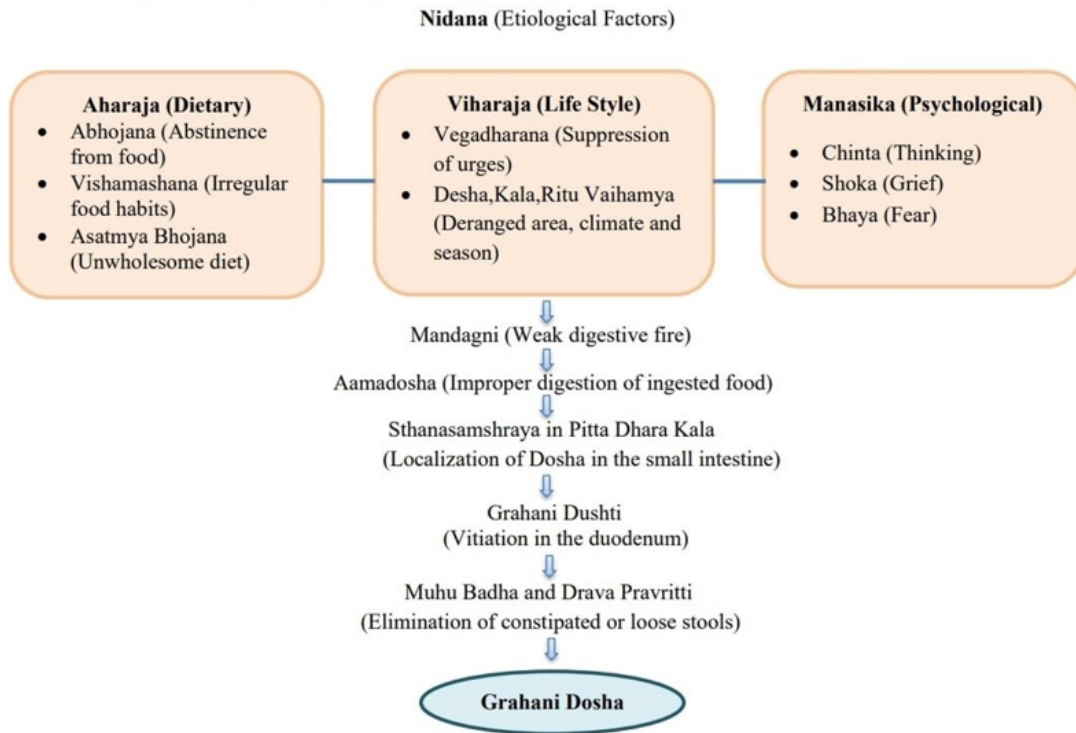


Figure 2: Pathophysiology of Grahani

Pathophysiology of Amlapitta

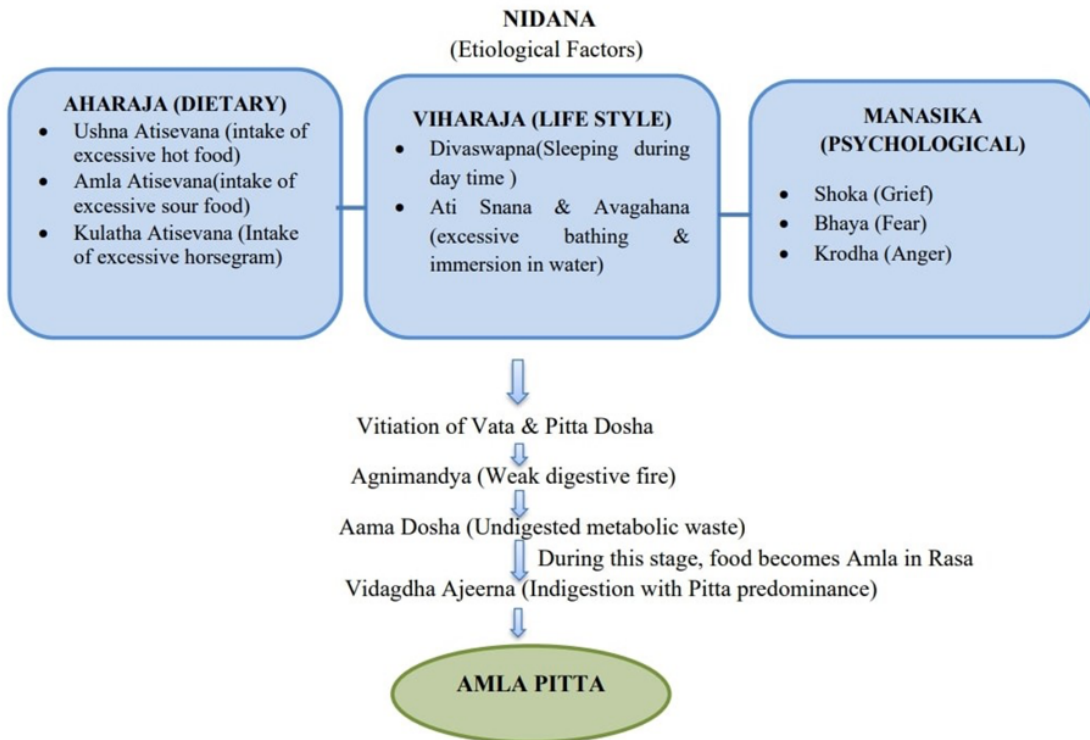


Figure 3: Pathophysiology of Amlapitta

DISCUSSION

Functional gastrointestinal disorders (FGIDs), the most common diagnoses in gastroenterology, are recognized by morphologic and physiological abnormalities that often occur in combination, including motility disturbance, visceral hypersensitivity, altered mucosal and immune function, altered gut microbiota, altered central nervous system processing. Research on these gut-brain interaction disorders is based on using specific diagnostic criteria. The Rome Foundation has played a pivotal role in creating diagnostic criteria, thus operationalizing the dissemination of new knowledge in FGIDs. Rome IV is the latest diagnostic criteria for FGIDs.

The digestive system is almost wholly under the influence of the autonomic nervous system, which is thought to be under the influence of the brain's limbic area. The brain's limbic area regulates emotions and mental processes via the autonomic nervous system. Thus, emotional and mental behaviour affects the functioning of the limbic system and autonomic nervous system, and as a result, the homeostasis of the digestive system gets disturbed. The appetite and satiety centres are located in the hypothalamus, although the central nervous system does not directly control digestion. The hypothalamic centres also regulate a person's behaviour and emotional equilibrium. Therefore, it can be stated that a person's thinking style, tense and unsatisfied mind, and pessimistic approach all affect digestion. This causes indigestion, acidity, and stomach discomfort. If the digestive function is disturbed, health also gets affected by this. Thus, non-pharmacological management, i.e., *adravyabhuta chikitsa*, plays a prime role in managing *annavaha srotas vikara* (disorders of the alimentary canal). *Dravya chikitsa* or *murta chikitsa* is based upon pharmacological properties, dosage form, the dose of the *dravya*, and the particular source from which *dravya* is procured. But *adravyabhuta chikitsa* or *amurta chikitsa* does not rely on such requisition. It is based on *upaya* and has a different mode of action.

Daivavyapasraya chikitsa (divine therapy) and *satvavajaya chikitsa* (psychotherapy) play a magnificent role in *adravyabhuta chikitsa*. Compliance with the principles of *ritucharya* (seasonal regimen), *dinacharya* (daily regimen), *sadvritta* (code of conduct), *achara rasayana* (behavioural conduct), etc., helps in maintaining the integrity of *agni* as former balance the *dosha*. *Nidana parivarjana* should also be followed by avoiding *nidana* like *adyashana* (eating before the digestion of previous food), *anashana* (no intake of food), *vegadharana* (suppression of urges), etc. *acharya* has defined *ashta ahara vidhivisheshayatana* (eight rules for consuming food) and *dwadasha ashanapravicharana* (the twelve kinds of food administration) in a very systematic and scientific manner. It gives basic dietary guidelines about choosing appropriate nutrition, the combination of food, cooking method, and quality and quantity of food. A thorough understanding of *ashta ahara vidhivisheshayatana* will help reduce *agni dushti* (digestive distress) and achieve both aims of Ayurveda, i.e., maintaining the health of a healthy individual and also curing the ailment of the diseased one.

CONCLUSION

FGIDs remain a therapeutic challenge because of their diverse symptomatology and the lack of a single target for drug intervention. The failure of conventional treatment, the poorly understood pathology, the psychological components of FGIDs, and the lack of definite pharmacological therapeutic strategies have compelled us to explore the scope of non-pharmacological management in FGIDs. Ayurveda has been serving the universe for ages with its perfection. Prevention is better than cure

perfectly matches this system. In contrast to contemporary medicine, Ayurvedic treatment ideology is based upon a holistic approach. Ayurveda treats the body, mind, and soul instead of treating the disease or symptom only. Thus, Ayurveda has got a magnificent role in the non-pharmacological management of FGIDs, but the potential of this treatment modality of Ayurveda is still underexplored. Therefore, more research should focus on disseminating Ayurveda's unrevealed potential.

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