



ANATOMICAL EXPLORATION OF AJĪRṆA (DIGESTIVE DISORDERS) W.S.R. TO ĪṢYĀ BHAYA KRODH APARIKṢATENA LUBDHENA ṢUGDAINYANIPĪDITENA PRADVEṢYUKTENA CA SAEVYAMĀNAMANNAṂ NA SAMYAK PARIṆĀMAMETI.

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ABSTRACT

Ajīrṇa is condition which is commonly known as indigestion or dyspepsia. The prevalence of dyspepsia varies through the world from 8.5% to 56% and is increasing day by day. *Acharya* have mentioned many psychological factors in the etiology of *Ajīrṇa* which indicates strong relations between these two. According to modern Anatomy the gastrointestinal tract is regulated by an intrinsic plexus of nerves known as the enteric nervous system (ENS) and an extrinsic plexus of

nerves that are part of the autonomic nervous system. Neurons of the ENS are arranged into two plexuses: The myenteric plexus and Sub mucosal plexus. Stimulation of the sympathetic nervous system inhibits activity of the gastrointestinal tract. Strong stimulation of the SNS can inhibit motor movements of the gut so greatly that this can inhibit the movement of the food and disturbs the GI function so the food is not digested properly leading to *Ajīrṇa*. So in case of *Ajīrṇa Roga* the person should be explored for psychological state first and treated accordingly through counselling and medicines.

KEYWORDS: *Ajīrṇa*, Myenteric plexus, Sub mucosal plexus.

INTRODUCTION

Ajīrṇa is condition which is commonly known as indigestion or dyspepsia. In *Āyurveda* *Ajīrṇa* is described as a symptom of other disease and also as a individual disease. It is a

condition in which the food is not digested properly due to various psychological and physical factors leading to the formation of *Annaviṣa* (food toxemia)^[3] condition which leads to many diseases like *Grahaṇī*, *Atisāra*, *Pāṇḍu*, etc. It is a common medical condition and its incidence rate is increasing day by day. The prevalence of dyspepsia varies through the world from 8.5% to 56%.^[1] It has non-specific symptoms found by the presence of upper abdominal pain or discomfort accompanied by other upper gastrointestinal symptoms, such as belching, vomiting, nausea, etc with or without them.^[2]

The clinical features are although not fatal but very much disturbing to the patient. In spite of tremendous advances in the field of diagnosis and treatment the extent of the disease is not decreased markedly so the *Āyurvedic* approach can be the alternative for this disease.

In this era of fastidious and competitive lifestyle stress and emotional complexes are becoming the part of the life that's why digestive disorders are increasing. *Acharya* have mentioned many psychological factors in the etiological factors of *Ajīrṇa* and mentioned that due to these factors the well consumed food will also not digest properly. So to contend these conditions it is essential to understand the relations of the emotional complexes and their effects on GI tract, so that they can be treated properly.

Ajīrṇa

- Causative factors:- Factors that vitiate *Agni* are responsible for *Ajīrṇa Roga* following factors are responsible for it - Excessive fasting, over and irregular eating; consumption of unwholesome diet, heavy, cold, excessively dry and contaminated meal; improper administration of purgation, emesis, and oleation therapies; emaciations due to diseases; faulty adaptation in respect to place, time and seasons; suppurations of Natural urges; excessive water intake.^[4]
- Psychological factors

ईर्ष्याभयक्रोधपरिक्षतेन लुब्धेन शुग्दैर्न्यनिपीडितेन ।

प्रद्वेषयुक्तेन च सेव्यमानमन्नं न सम्यक् परिणाममेति॥५०१॥ सु.सू.४६/५०१

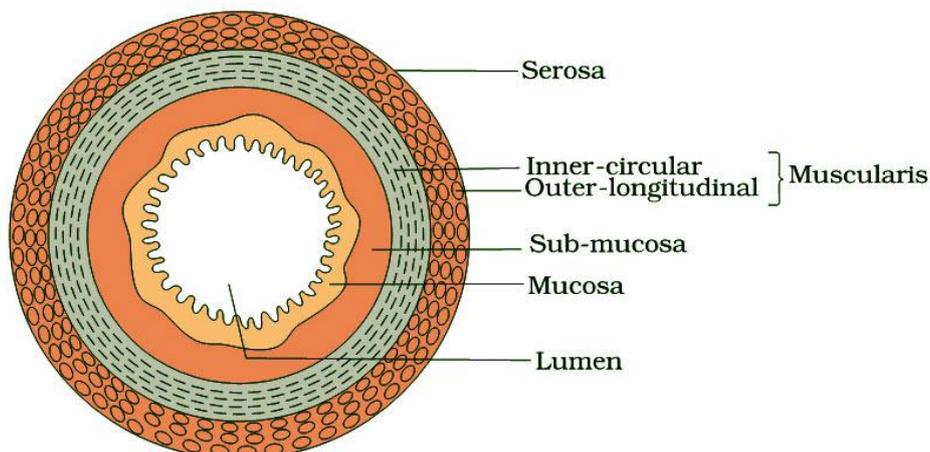
(*Īṣyā bhaya krodh aparikṣatena lubdhena ṣugdāinyanipīditena Pradveṣyuktena ca saevyamānamannaṃ na samyak pariṇāmameti.*)

Usually the person suffering from emotional or psychological disturbances due to either cause like loses his appetite to a remarkable level. In this condition that person is not able to digest the food properly leading to the condition of *Ajīrṇa*.^[5]

- *Samprapti* of *Ajīrṇa*:- Due to above mentioned etiological factors *Agni* becomes greatly vitiated and manifests *Ajīrṇa*. Patients of *Ajīrṇa* is not able to digest the food even if he consumes the wholesome diet at proper time. This undigested food leads to the formation of *Annavisha*.^[6]
- *Ajīrṇa Bheda*:- It is of six types of *ajirna* namely *Āmājīrṇa*, *Vidagdḥājīrṇa*, *Viṣṭbdḥājīrṇa* caused by vitiated *Kapha*, *Pitta* and *Vāta* respectively.^[7] Some says *Rasa-śeṣājīrṇa* is the fourth variety, fifth variety is *Dinapākājīrṇa* and sixth variety is *Prākṛtaājīrṇa*.^[8]
- *Ajīrṇa Lakṣṇa* (common signs and symptoms of *Ajīrṇa*):- Abdominal distension, general malaise, headache, fainting, giddiness, stiffness in back and waist, yawning, body ache, thirst, fever, vomiting, tenesmus, anorexia and indigestion. This is a serious condition known as *Annaviṣa*.^[9]

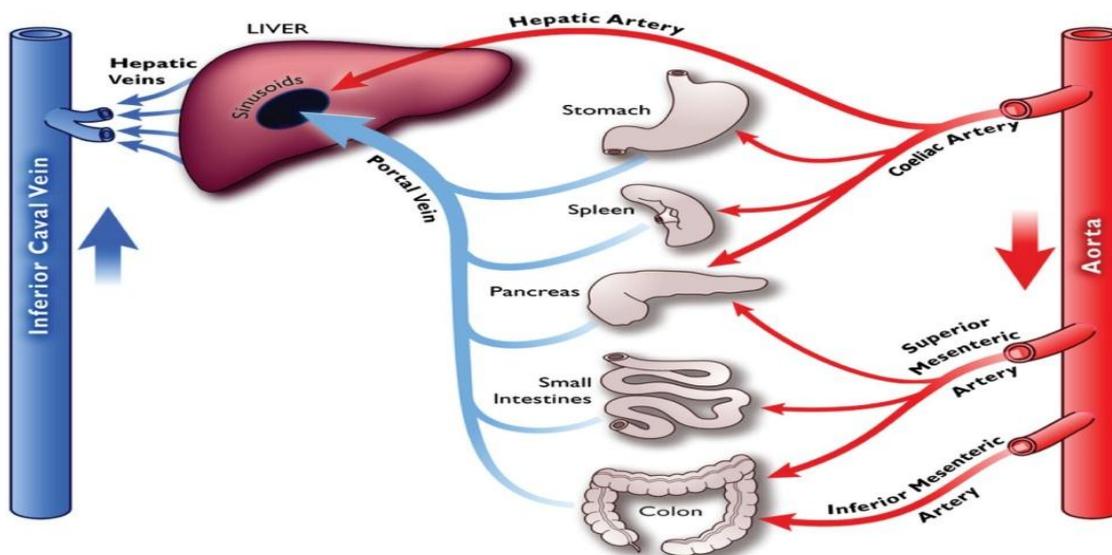
Anatomy of the digestive tract.

A section of the Intestinal wall, including the following layers from the outer surface to inward.^[10]



- (1) serosa (2). longitudinal muscle layer (3). Circular muscle layer (4). Submucosa
(5). Mucosa

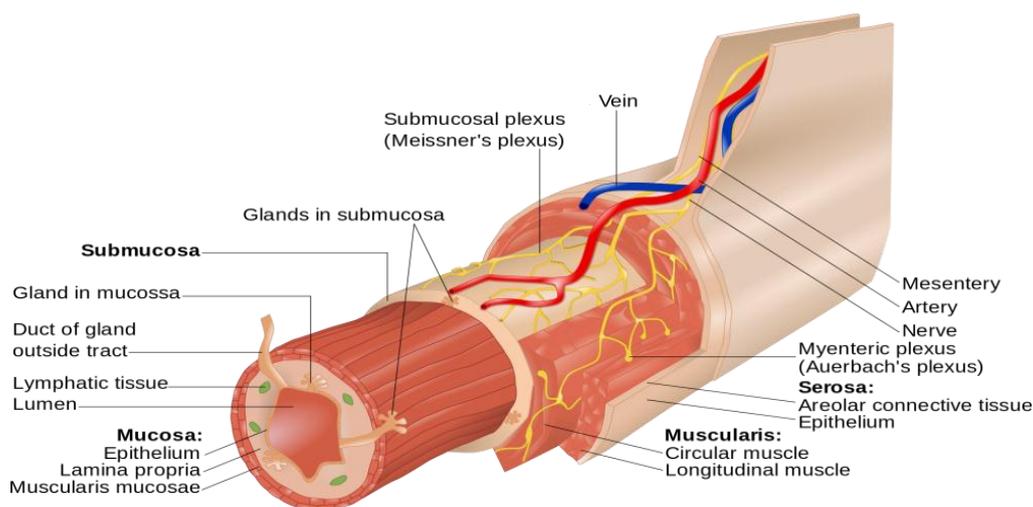
▪ **Gastrointestinal blood flow.**



The blood vessels of the gastrointestinal system are part of a more extensive system called the splanchnic circulation. The superior and inferior mesenteric artery supplying the wall of the small and the large intestine by way of an arching arterial system. The design of the splanchnic circulation is such that all the blood through the gut, spleen and pancreas then flow immediately into the liver by way of the portal vein. In liver the blood passes through millions of fine liver sinusoids and finally leaves the liver by way of the hepatic veins that empty in the inferior vena cava of the general circulation.^[11]

▪ **Neural Innervations of the GI Tract.**^[12]

The gastrointestinal tract is regulate by an intrinsic set of nerves known as the enteric nervous system and an extrinsic set of nerves that are part of the autonomic nervous system.



(A)- Enteric Nervous System.

100 million neurons that extend from the oesophagus to the anus. Neurons of the ENS are arranged into two plexuses: 1. The myenteric plexus and 2. Sub mucosal plexus.

1. Myenteric plexus or plexus of Auerbach's is located between the longitudinal and circular smooth muscle layers of the muscularis.

- Peristalsis- The motor neurons of myenteric plexus supply the longitudinal and circular smooth muscle layers of the muscularis, this plexus mostly controls GI tract motility (movement), particularly the frequency and strength of contraction of muscularis.
- Coordinated waves of descending inhibition follow by waves of descending excitation. Extrinsic parasympathetic cholinergic nerves (vagal and sacral) excite peristalsis and stimulate the gut contents. Sympathetic noradrenergic nerves inhibit the transit of gut contents.

2. The sub mucosal plexus or plexus of Meissner, is found within the sub mucosa. The plexus of the ENS consists of motor neurons, interneuron and sensory neurons. The motor neurons of the sub mucosal plexus supply the secretory cells of the mucosal epithelium, controlling the secretion of the organs of the GI tract. The interneuron of the ENS interconnects the neurons of the myenteric and sub mucosal plexus. The sensory neurons of the ENS supply the mucosal epithelium. Some of these sensory neurons function as chemoreceptors, receptors that are activated by the presence of certain chemicals in food located in the lumen of GI organs. Other sensory neurons function as stretch receptors, receptors that are activated when food distends (stretches) the wall of a GI organ.

B) Autonomic nervous system

Although the neurons of the ENS can function independently, they are subject to regulation by the neurons of the autonomic nervous system. The Vagus nerve supplies the parasympathetic fibres to most parts of the GI tract, with the exception of the last half of the large intestine, which is supplied with parasympathetic fibres from the sacral spinal cord. The parasympathetic nerves that supply the GI tract form neural connections with the ENS. Stimulation of the parasympathetic nerves that innervate the GI tract causes an increase in GI secretion and motility by increasing the activity of ENS neurons.

The sympathetic nerves that supply the GI tract arise from the thoracic and upper lumbar regions of the spinal cord. Sympathetic postganglionic neurons synapse with neurons located

in the myenteric plexus and the sub mucosal plexus. In general the sympathetic nerves that supply the GI tract causes a decrease in GI secretion and motility by inhibiting the neurons of the ENS. Emotions such as anger, fear, and anxiety may slow digestion because they stimulate the sympathetic nerves that supply the GI tract.

DISCUSSION

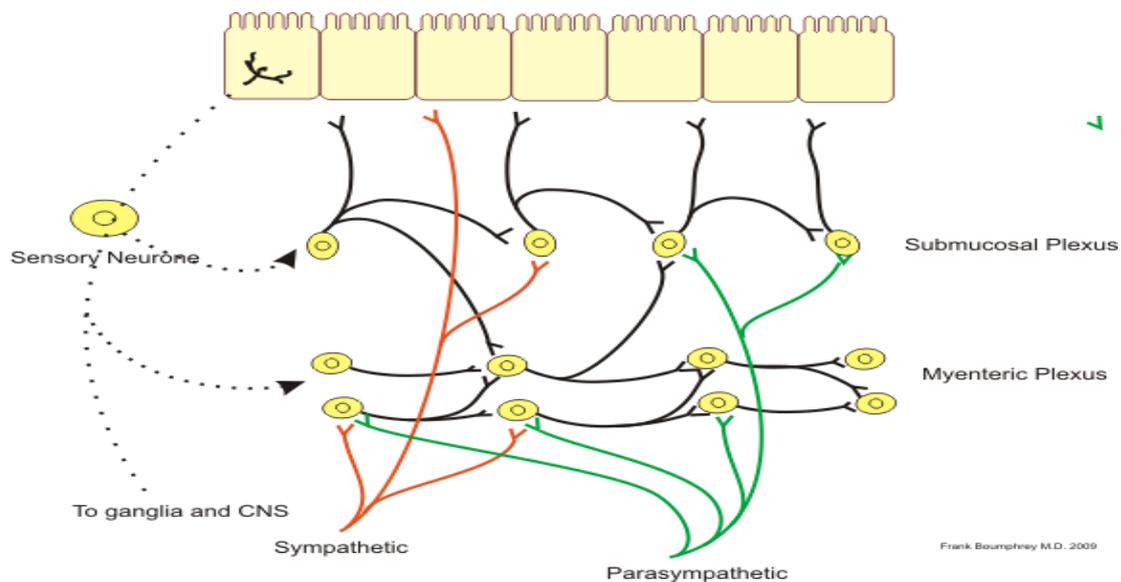
The ancient sages of *Āyurveda* have explained many scientific facts in *Sūtra* form which are very scientific and still have practical utility. In *Āyurvedic* the Upper digestive system is explained in the context of *Annavaha Srotas* and many diseases related to digestive system are also explained. Many of the diseases and maximum disorders of Upper GIT occurs due to emotional/ psychological disturbances, means the disturbed psychology act as triggering factor for maximum of Upper GIT disorders. In the context of *Ajīrṇa Ācārya* has explained that even if a physically healthy person is consuming proper nutritious diet and also following the *Astahara vidhi* regimen but if he is not in proper psychological state then he will suffer from *Ajīrṇa roga*. due to psychological factors the good quantitative food will also not be digested properly leading to *Ajīrṇa* (indigestion). It means GIT is primarily controlled by the psychological state of the person.

Peristaltic movement and digestive secretion are two main factors for the proper digestion. Every day, seven litres of fluid is secreted by the digestive system. which is composed of four primary components: ions, digestive enzymes, mucus, and bile. About half of these fluids are secreted by the salivary glands, pancreas, and liver, which compose the accessory organs and glands of the digestive system. The rest of the fluid is secreted by the GI epithelial cells. This peristalsis movement and the digestive secretions are controlled by the myenteric and meissner plexuses respectively.

The psychological factors explained by *Ācārya Suśruta* like jealousy, fear, anger, miseries, grief, helplessness and heartedness affects the sympathetic nervous system. Sympathetic supply of upper GIT is from T5 to L2 spinal segment. Most of the preganglionic fibres that innervate the gut, after leaving the cord, enter the sympathetic chains that lie lateral to the spinal column, and many of this fibres then pass on through the chains of outlying ganglia such as to the celiac ganglion and various mesenteric ganglion. Most of the post ganglionic sympathetic neuron bodies are in this ganglia, and post ganglionic fibres then spread through postganglionic sympathetic nerves to all parts of the gut¹³. The sympathetic innervate essentially all of the GIT, rather than being more extensive nearest the oral cavity and anus,

as is true of the parasympathetic. The sympathetic nerve endings not only secrete mainly norepinephrine but also small amount of epinephrine.

In general, stimulation of the sympathetic nervous system inhibits activity of the gastrointestinal tract, causing many effects opposite to those of the parasympathetic system. It exerts its effect in two ways: 1. To a slight extent by direct effect of secreted norepinephrine to inhibit intestinal tract smooth muscles. 2. to a major extent by an inhibitory effect of norepinephrine on the neurons of the entire enteric nervous system.



Strong stimulation of the SNS can inhibit motor movements of the gut so greatly that this can literally block the movement of the food through the gastrointestinal tract. Thus the activated sympathetic nervous system inhibits the motor neurons of the meissner plexus and decreases the gastric secretions which are essential for the digestion and also inhibit the function of the motor neurons of the myenteric plexus and stops the peristalsis movements. It means that the activated sympathetic nervous system totally upset the GI function so the healthy and even little quantity of food does not digest and causes *Ajirna*.

CONCLUSION

Ajirna is very common and hazardous condition leading to various disorders by producing free radicals in the body. Later on Free radicals effects the other systems of the body and hence the concept of *Nidanarthkar Roga of Ayurveda* stands firmly. Though ancient sages have not directly explained the anatomy of GI tract but they know that psychological factors playing a major role in this condition. In today's generation these psychological factors are

more affecting the population and that's why the incidence rate of GI Tract disorders is increasing day by day. So in case of *Ajṛṇa Roga* the person should be explored for psychological state first and treated accordingly through counselling and medicines.

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