

APPLIED PHYSIOLOGY OF GRAHANI ROGA WITH EMPHASIS ON MALABSORPTION SYNDROME

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ABSTRACT

The importance of *Pachaka Pitta* is emphasized by stating that every disease is due to impaired function of *Agni*. The *Grahani* is vitiated due to *Mithyahaaraviharas* which disturb the *Jatharagni*. The factors like *Vishmasana*, *Asatmyabhojana* etc. causing *Agnimandya* finally leading to *Grahani roga*. Malabsorption is a clinical term that encompasses defects occurring during the digestion and absorption of food nutrients by infections of gastrointestinal tract. In general, the digestion and absorption of food materials can be divided into 3 major phases: Luminal, mucosal and post absorptive. The luminal phase is the stage in which dietary fats, proteins and carbohydrates are hydrolyzed and solubilized by secreted digestive enzymes and bile. The mucosal phase relies on the integrity of brush-border membrane of intestinal epithelial cells to transport digested products from the lumen into the cells and in the post absorptive phase, reassembled lipids and other key nutrients are transported via lymphatic's and portal circulation from epithelial cells to other parts of body. Perturbation by disease process in any of these phases frequently results in malabsorption. Luminal phase can be considered to the role of *Pachaka Pitta*, Mucosal phase to *Kledaka Kapha* and post absorptive phase to *Samana Vaayu*.

KEYWORDS: Grahani, Malabsorption, Pachaka Pitta, Samana Vayu, Kledaka Kapha.

INTRODUCTION

Life-span, complexion, strength, health, enthusiasm, corpulence, lustre, immunity, energy, heat processes and vital breath - all these depend on body fire (*Agni*). One dies if this body fire is extinguished, lives long free from disorders if it is functioning properly, gets ill if it is deranged, and hence *Agni* is the root cause of all¹. The root cause of all disease lies within the process of digestion, when the digestive system is working at its optimum supported by correct lifestyle and correct

quantity and quality of food as per the individual *Prakruti*. The seat of *Antaragni* (*Jatharagni*) is known as *Grahani*².

The *Grahani* is vitiated due to *Mithyahaaraviharas* which disturb the *Jatharagni*. The factors like *Vishmasana*, *Asatmyabhojana* etc. causing *Agnimandya* finally leading to *Grahani roga*. "*Grahani Roga*" symptomatically can be compared to malabsorption syndrome. Malabsorption Syndrome is a clinical term that encompasses defects occurring during the

digestion and absorption of food nutrients by the gastrointestinal tract.

GRAHANI

Grahani is a tubular organ i.e., *Nadi* situated above the umbilicus in between *Amashaya* & *Pakwashaya*³. It is also considered as *Agniadisthana*. The *Grahani* has been stated to be the seat of *Pachaka Pitta*, *Samana Vayu* and *Kledaka Kapha*. *Grahani* is been described as “*Annasya Grahani* *Grahani math*” according to Charaka. i.e. *Grahani* receives food, so it is called as *Grahani* while commenting Chakrapani termed “*Grahani*” as “*Dharani*” means retention⁴. The sixth *kala* i.e., *Pittadharakala* is located between *Aamashaya* and *Pakwashaya* also known as *Grahani* as the ingested food is retained by this *kala*⁵. Totally *Grahani* receives supports and retains the food for the process of digestion.

GRAHANIROGA

Strength of *Grahani* depends upon strength of *Agni* present in *Grahani*. The impairment of *Agni* leads to *Dooshana*⁶ i.e. structural defect and functional impairment of *Grahani* (*Grahani* *rupanaadi*) resulting in *Grahani* *roga*. *Grahani* *roga* can develop independently by factors responsible for vitiation of *Agni* or may depend on *atisara*, debilitating chronic systemic disorders (*vyadhikarshana*), iatrogenic factors like faulty administration of *Snehana*, *Vamana* and *Virecana*⁷.

MALABSORPTION SYNDROME

Malabsorption Syndrome (MAS) is a clinical term that encompasses defects occurring during the digestion and absorption of food nutrients by the

gastrointestinal tract. MAS are subdivided into 2 broad groups:

1. Primary MAS, which is due to primary deficiency of the absorptive mucosal surface and associated enzymes.

2. Secondary MAS, in which mucosal changes result secondary to other factors such as disease, surgery, trauma and drugs⁸. In general, the digestion and absorption of food materials can be divided into 3 major phases: The luminal phase, mucosal phase and post-absorptive phase.

a. The luminal phase is the phase in which dietary fats, proteins, and carbohydrates are hydrolyzed and solubilized by secreted digestive enzymes and bile.

b. The mucosal phase relies on the integrity of the brush-border membrane of intestinal epithelial cells to transport digested products from the lumen into the cells.

c. In the post - absorptive phase, reassembled lipids and other key nutrients are transported via lymphatic and portal circulation from epithelial cells to other parts of the body.

CAUSES OF MALABSORPTION SYNDROME

The best way to classify the numerous causes of malabsorption is to consider the 3 phases of digestion and absorption.

1. Impaired nutrient hydrolysis:

a) The most common cause for impaired nutrient hydrolysis is hepatic and pancreatic insufficiency due to chronic pancreatitis, pancreatic resection, pancreatic cancer, or cystic fibrosis⁹.

b) Inadequate mixing of nutrients, bile, and pancreatic enzymes, as seen in rapid intestinal transit, gastro-jejunostomy, total and partial gastrectomy, or intestinal

resection after mesenteric emboli or thrombosis, also causes impaired hydrolysis.

c) Resection of bowel

d) **Lactose intolerance:** Lactose intolerance is the inability to break down a type of natural sugar called **lactose**. Lactose is commonly found in dairy products, such as milk and yogurt, which causes osmotic diarrhea¹⁰.

e) **Whipple's Disease:** Whipple's disease is a rare bacterial infection that most often affects the gastrointestinal system. Whipple's disease interferes with normal digestion by impairing the breakdown of foods, such as fats and carbohydrates, and hampering the body's ability to absorb nutrients¹¹.

2. Impaired brush-border hydrolyze activity:

a) Immunoglobulin A (IgA) deficiency (most common immunodeficiency) is due to decreased or absent serum and intestinal IgA, which clinically appears similar to celiac disease and is unresponsive to a gluten-free diet¹².

b) **Celiac disease:** Is a digestive disorder. It is caused by an immune reaction to gluten¹³.

c) **Tropical Sprue:** Tropical sprue is caused by inflammation of the intestines. This swelling makes it more difficult for you to absorb nutrients from food.

d) Acute infectious enteritis¹⁴.

3. Post - absorptive Phase:

Obstruction of the lymphatic system, both congenital (eg, intestinal lymphangiectasia, Milroy disease) and acquired (eg, Whipple disease, neoplasm [including lymphoma], tuberculosis), impairs the absorption of chylomicrons and lipoproteins and may

cause fat malabsorption or a protein-losing enteropathy.

CLINICAL FEATURES OF MAS¹⁵:

1. Steatorrhoea
2. Chronic diarrhoea
3. Abominal distention
4. Anorexia
5. Weight loss
6. Muscle wasting
7. Dehydration
8. Hypotension.

DISCUSSION

Role of Agni in grahani:

Chakrapani says the sole function of *Agni* "Agni guna janakamevechana dravya janakam¹⁶" *Agni* only brings out a change of either qualities (or quantities) i.e., *Gurvadi Gunas*, but never produces a new substance or *Dravyas* which indicates that *Agni* is the factor responsible to bring about the breakdown and synthesis of substances (i.e. catabolic and anabolic activities). In a nutshell all changes occurring at microscopic, macroscopic, inorganic & organic levels are due to *pakakarmas* of *Agni*. All the material consumed by human must be digested absorbed and assimilated to the agency of *Agni* only. The *Grahani* is vitiated due to *mithyahaaraviharas* which disturb the *jatharagni*. The factors like *vishmasana*, *asatmyabhojana* etc. causing *Agnimandya* finally leading to *Grahani roga*.

Pachaka Pitta - Digestion:

The *pachaka pitta* is located in *Grahani* and food is digested by this *Pitta*, *Pacaka Pitta* has *Drava* in nature and it mixed with food resulting in moister of food and due to moistened food it is easily digestible. The digestive juices described in modern

physiology such as saliva, gastric juice, pancreatic juice, insulin, bile etc are included in *Pachaka Pitta*¹⁷. This function of *Pitta* is similar to the functions of secreted digestive enzymes and bile which helps in digestion by which dietary fats, proteins, and carbohydrates are hydrolyzed and solubilized.

Kledhaka Kapha- Absorption:

When food reaches *Jathara* it retains there for 2 to 3 hrs. Here quantity of *Kledaka Kapha* (mucin) and *Pachaka Pitta* (hydrochloric acid) increase considerably *Kledaka Kapha* in the beginning and *Pachaka Pitta* afterwards. *Kledaka Kapha* (mucin) breaks down the food material in to finer particles (*Bhinna-sanghata*), soaks it thoroughly and imparts the necessary fluid consistency (*Klinnata*) so that *Pachaka Pitta* can penetrate into every particle of food and bring about *Paka*. The *Madhura veerya* of *Kapha* and its *Sheetha guna* of *Kledaka Kapha* aids to protect the *Amashaya*. The seat of *Kapha* is situated above *Pitta*. The primary function of *Pitta* is heating in an upward direction due to *Tejo guna* and its *Urdwagaami* nature. On the other hand *Kapha* is endowed with a property of cooling. In this *Kapha* act as *Chandra* in relation to *Aditya (Pitta)*. Thus the cooling property of *Kapha* counter the heating property of *Pitta*. Hence *Kledaka Kapha* protects the *Amashaya* from being digested by *Pitta*. This protective function of *Kledhaka kapha* can be compared to maintain the integrity of the brush-border membrane of intestinal epithelial cells to transport digested products from the lumen into the cells.

Samanavayu-Transportion:

Samanavata is located near seat of *Agni*. The word *Agni* should be understood as *Antaragni* or *Pachakagni*. The functions of *Samana Vata* are to stimulate the *Agni*, and after digestion is completed, it helps in the separation of nutrients from the residue. According to *Sharangdhara*, *Samanavata* helps in the propulsion of the *Rasa* (nutrient part after digestion) to *Hridaya*. This function of *Samanavayu* can be compared to the post absorptive phase of digestion of contemporary science in which reassembled lipids and other key nutrients are transported via lymphatic and portal circulation from epithelial cells to other parts of the body by the pumping action of heart.

CONCLUSION

Grahani Roga symptomatically can be compared to malabsorption syndrome. The *Grahani* has been stated to be the seat of *Pachaka Pitta*, *Samana Vayu* and *Kledaka Kapha*, any impairment in these functions leads to *Grahani Roga*. Malabsorption Syndrome is a clinical term that encompasses defects occurring during the digestion and absorption of food nutrients by the gastrointestinal tract. In general, the digestion and absorption of food materials can be divided into 3 major phases: Luminal, Mucosal and Post - absorptive phases. The luminal phase in which dietary fats, proteins, and carbohydrates are hydrolyzed and solubilized by secreted digestive enzymes and bile can be considered to be the role of *Pachaka Pitta* which is responsible for the breakdown and synthesis of substances i.e. catabolic and anabolic activities. Mucosal phase relies on the integrity of the brush-border membrane

of intestinal epithelial cells to transport digested products from the lumen into the cells is compared to *Kledaka Kapha* by the virtue of its cooling property which counter the heating property of *Pitta*. Post absorptive phase in which reassembled lipids and other key nutrients are transported via lymphatic and portal circulation from epithelial cells to other parts of the body can be compared to *Samana Vaayu* which transports the formed *Ahara Rasa* to *Hridaya*. *Pachaka pitta* is form of *Agni* found in *Amashaya*. *Kledak Kapha* is the factor which is essential for lubrication and moistening of food for proper digestion. *Grahani* Structurally has *Pittadhara Kala* having major role in digestion. *Pachaka Pitta-Kledaka Kapha-Samana Vayu* is physiological content of *Grahani*.

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