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 *Mithyaharaviharas* 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 Vayu*.

**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 all. 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 *Graham*.

The *Grahani* is vitiated due to *Mithyaharaviharas* 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. 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 Grahana Grahani math” according to Charaka. i.e. Grahani receives food, so it is called as Grahani while commenting Chakrapani termed “Grahana” as “Dharana” means retention. The sixth kala i.e., Pittadharakala is located between Amashaya and Pakwashaya also known as Grahani as the ingested food is retained by this kala. 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 i.e. structural defect and functional impairment of Grahani (Grahanirupanaadi) resulting in Grahaniroga. Grahaniroga 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.

**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 drugs.

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 fibrosis.
   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 diarrhea. max.
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 nutrients.

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 diet.
b) Celiac disease: Is a digestive disorder. It is caused by an immune reaction to gluten.
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 entritis.

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 MAS:
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 grahami:
Chakrapani says the sole function of Agni “Agni guna janakamevechana dravya janakam”, 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 mithyaharaviharas 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 Amasaya. 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 Sharangadhara, 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 Kaptha 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 Vaayu is physiological content of Grahani.

REFERENCES

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