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Laboratory and Diagnostic Approaches in the Evaluation of *Grahani Roga*: A Comprehensive Review

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ABSTRACT

According to *Chakrapani*, *GrahaniDosh* is described as "*GrahaniAshrita Agni Dosh*," indicating that impairment of *Agni* localized in *Grahani* leads to its pathological manifestations. The derangement of *Agni* from its normal physiological state to *Mandagni*, *Tikshnagni*, or *Vishmagni* is influenced by the imbalance of *Pachaka Pitta*, *SamanaVayu*, and *KledakaKapha*. Since *Grahani* is the *Ashraya* (seat) and *Agni* is the *Ashrita* (resident), disturbance of *Agni* results in defective digestion, formation of *Ama*, and impaired absorption of nutrients, ultimately leading to *GrahaniRoga*.

From a contemporary perspective, the physiological functions of *Agni* can be correlated with the coordinated actions of digestive secretions and enzymes, including pancreatic enzymes, bile, and intestinal enzymes such as enterokinase, erepsin, sucrase, lactase, and maltase. These factors are essential for the digestion and absorption of carbohydrates, proteins, and fats. Dysfunction of these digestive mechanisms parallels the concept of *Agnivaishamya* described in *Ayurveda*.

The present article aims to correlate the *Ayurvedic* concept of *GrahaniDosh* with modern laboratory investigations and diagnostic procedures used to evaluate digestive and absorptive functions. Laboratory assessment of digestive enzymes, pancreatic and biliary function, and investigations such as sigmoidoscopy and colonoscopy are discussed in relation to their role in assessing disease activity and extent. The article also explores the relevance of these investigations in clinical conditions corresponding to *GrahaniRoga*, including irritable bowel syndrome (IBS) and primary and secondary malabsorption syndromes, thereby providing an integrative perspective on the diagnosis and evaluation of *GrahaniRoga*.

Key Words *Agni*, *GrahaniRoga*, IBS, Malabsorption syndrome

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INTRODUCTION

Grahani is considered one of the most significant disorders of the gastrointestinal tract in *Ayurveda*.

According to the classical texts, *Grahani* is the seat of *Agni* and is responsible for digestion, absorption, and assimilation of food. Impairment

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of *Jatharagni* leads to incomplete digestion, resulting in the formation of *Ama* and manifestation of *GrahaniRoga*. Digestion and absorption of nutrients is prime process occurring in *grahani* mediated by *agni* in normalcy. This normal process is disturbed due to *agnidusti* manifesting as *vishamagni*, *teekshnagni* and *mandagni* collectively called as *grahanidosha*, it is one among *astamahagada*.¹

The diagnosis of *Grahani* in *Ayurveda* is mainly based on clinical features such as irregular bowel habits, indigestion, abdominal pain, bloating, and loss of appetite, weakness, and passage of improperly digested food. However, modern laboratory investigations are valuable for ruling out differential diagnosis, identifying nutritional deficiencies, evaluating disease severity, and detecting complications.

The sign and symptom of *GrahaniRoga* is almost similar to Irritable Bowel Syndrome (IBS), Primary & Secondary Malabsorption syndrome described in modern science.

Irritable Bowel Syndrome (IBS) is a functional gastrointestinal disorder characterized by recurrent abdominal pain associated with altered bowel habits (diarrhea, constipation, or both), in the absence of any identifiable structural, biochemical, or inflammatory abnormalities that can explain the symptoms.²

Malabsorption syndrome is a group of disorders characterized by impaired digestion and/or absorption of nutrients from the gastrointestinal tract, resulting in deficiencies of macronutrients (carbohydrates, proteins, and fats) and

micronutrients (vitamins and minerals). It may result from abnormalities in intraluminal digestion, intestinal mucosal absorption, or nutrient transport.³

Hence laboratory and other procedures used for detection of *grahanidosha* would comprised, factors responsible for mal digestion, mal absorption and malformed food substances identified as *ama*.

NIDANA OF GRAHANI ROGA⁴

- *Aharaja* – *Abhojana*, *Atibhojana*, *Vishamabhojana*, *AsatmyaBhojana*
- *Vyapad* of *Vamana*, *Virechana* and *Snehapana*.
- *Vega Vidharana*
- *Virudha* or incompatibility of *Desha*, *Kala* and *Rutu*.
- *Shoka*, *Krodha*, *Bhaya*

ROOPA OF GRAHANI ROGA⁵

- *AtiSrushta Mala Pravrutti*, *Vibadha Mala Pravrutti*
- *Arochaka*
- *Asyavairasya*
- *Praseka*
- *Tamaka*
- *Shunapada-Kara*
- *AsthiparvaRuk*
- *Chardana*
- *Jwara*
- *LohanugandhiUdgara*

TYPES OF GRAHANI ROGA⁶

1. *VatajaGrahani*

- Specific character - Flatulence after and during digestion.

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- Generalized symptoms - Roughness in body, dryness of throat and mouth, hunger, thirst, blurred vision, tinnitus, Pain in chest, thigh, pelvic region, neck region, emaciation, weakness, anal fissures, cough and dyspnea.
- Abdominal symptoms - Food digest with difficulty, *Suktapaka*, *visuchika*.
- Character of Stool - Passes stool with difficulty, liquid mixed with hard stool, frothy, undigested repeatedly.

2. *PittajaGrahani*

- Specific character - Fetid and sour eructation
- Generalized symptoms - Roughness in body, dryness of throat, mouth.
- Hunger, thirst, blurred vision, tinnitus, pain in chest, thigh, pelvic region, neck region, weakness, anal fissures, cough, dyspnea
- Character of stool - Watery, undigested, yellowish stool.

3. *KaphajaGrahani*

- Specific character - Heaviness and stiffness of abdomen
- Generalized symptoms - Nausea, vomiting, anorexia, and sweetness of mouth, cough, rhinitis and eructation having foul smell, lack of desire towards women, weakness and lassitude.
- Character of stool - Stool not well formed but broken into pieces, mixed with *Ama* and mucous and heavy.

4. *SannipatajaGrahani* - Mixed *Lakshana* of *Vataja*, *Pittaja* and *KaphajaGrahani*.

5. *Sangrahani* -

- Specific character - Disease aggravates during day time and pacifies in night time, disease

repeats once in 15 days, 30 days, and 10 days or once in a day.

- Generalized symptoms - Lassitude, debility, general malaise, low backache.
- Abdominal symptoms - Intestinal gurgling.
- Character of stool - Watery, cold, solid, sliminess, unctuous with *Ama*, frothy and passed with sound.

6. *Ghatyantra Grahani*⁷ -

- Specific character - Produces sound while passing stool like pouring water out of a pot.
- Generalized symptoms - Excessive sleep, pain in side of chest.

Analysis of *Dosha* involvement in diagnosis of *Grahani*

Alimentary Hormones play a vital role along with pancreatic juice, bile juice and intestinal enzymes in digestion, hence ascribed as constituents of *agni*.

GrahaniRoga is primarily caused by *Agnimandya* (impaired digestive fire). The normal digestive process depends on the coordinated action of *Pachaka Pitta*, *SamanaVata* and *KledakaKapha*. Any imbalance in these three *doshas* disrupts digestion, absorption, and assimilation, leading to *Grahani*.

*Pachaka pitta*⁸

Pachaka Pitta is located in the *Grahani* (*Pittadhara Kala*), situated between the stomach (*Amashaya*) and large intestine (*Pakwashaya*). It helps in digestion, separates *Sara* (nutritive portion) from *Kitta* (waste), nourishes all other subtypes of *Pitta*, supports the function of *Jatharagni*.

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When *Pachaka Pitta* becomes abnormal food is incompletely digested, *Grahani* cannot retain food until digestion is complete, undigested food passes into the intestine, leading to diarrhoea, constipation, or alternating bowel habits.

***Samana vata*⁹**

- *Gati* is the function of *vata*. Hence, abnormal secretory functions of alimentary hormones, pancreatic juice, bile juice and intestinal enzymes will be encountered in *samanavata dusti* due to *chala* and *sookshmaguna* of *vata* being afflicted. Hence repeated increase and decrease in secretion of these factors will occur.

- The motility of GI tract muscles can be recorded through Antroduodenal or small bowel manometry, these motility tests record the pattern of contraction of GI tract muscles as motility can be ascribed to function of *Samanavata*.

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***Kledaka kapha*¹⁰**

In *Grahani Roga*, *Kledaka Kapha* may become either vitiated (*dushti*) or depleted (*kshaya*). Excess *Kledaka Kapha* causes excessive heaviness and moisture in the stomach. Suppresses or weakens *Agni* (*Mandagni*) leads to incomplete digestion of food results in formation of *Ama* (undigested toxic material) *ama* reaches the *Grahani*, impairing its ability to retain and digest food.

ASSESSMENT AND DIAGNOSIS

History taking and physical examination plays a crucial role in early diagnosis and Assessment. A diagnosis requiring more specific testing in non-specific symptoms of unintentional weight loss, ongoing diarrhoea, or poor wound healing.

- History taking and physical examination
- Assessment of strength of *Agnibala* and *Avastha* (stage) of *Agni Dusti*.
- *Purisha Pariksha*
- Laboratory testing

History taking and physical examination

In evaluating *Grahani*, history taking focuses on uncovering the chronicity of symptoms, dietary triggers, and the state of the patient's digestive capacity. Physical assessment helps grade the severity of the illness and rule out red-flag conditions by checking the signs of malnutrition, dehydration or anemia.

Assessment of strength of *Agni bala* and *Avastha* (stage) of *Agni Dusti*

Grahani is defined as the seat of *Agni*. Evaluating *Agnibala* is fundamentally an assessment of digestive strength and metabolic capacity, which is classically categorized into four states like *Vishamagni*, *Teekshnagni*, *Mandagni* and *Samagni*.

Determining the *Avastha* involves assessing how far the disease has progressed and whether it is associated with *Ama* or *Dhatu Kshaya* which is assessed through *sama* and *niramarogalakshanas*.

***Purisha Pariksha*¹¹:**

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PurishaPariksha (stool examination) is one of the *AshtasthanaPariksha* and plays a key role in diagnosing *GrahaniRoga*, as *Grahani* is primarily caused by *Mandagni* (impaired digestive fire) and *Ama*. Careful examination of stool helps assess the status of *Agni*, *Dosha* involvement, and disease severity.

• *Vataja*: *Ruksha* (dry), *Alpa* (scanty), *Phenila* (frothy), irregular evacuation.

• *Pittaja*: *Peeta* (yellow), *Neela/Harita* (bluish-green), *Drava* (liquid), *Durgandha* (foul smell), hot and burning.

• *Kaphaja*: *Picchila* (slimy), *Guru* (heavy), *Shveta* (whitish), *Ama-yukta* (mixed with undigested material), mucus-laden.

• *Sannipataja*: Variable stool showing combined features of *Vata*, *Pitta*, and *Kapha*.

Jalanimajjanapariksha

It is the objective method which was used to detect the presence of *Ama* in stool in ancient time. In *SaamajaPurisha* it sinks in water, if *Purisha* is free from *Ama* it floats on water. This traditional method is described as an aid to assess *Ama* and *Agni*.

Physical examination of stool

- **Consistency**: Alternating between hard and loose/watery stools (*MuhurbaddhaMuhurdrava*). It may also contain undigested food particles.
- **Mucus**: Frequent presence of sticky, thick mucus, often mixed with foul-smelling, improperly digested faeces (*Ama*).
- **Colour & Froth**: Stools can appear yellowish, greenish, pale, or frothy depending on

which *Dosha* (*Vata*, *Pitta*, *Kapha*) is predominantly aggravated.

Chemical examination

- **Stool pH**: A fecal pH that is too acidic (typically < 5.5) often indicates carbohydrate malabsorption (e.g., lactose intolerance or bacterial fermentation).
- **Fecal Fat**: Increased lipid levels in the stool (steatorrhea) indicate fat malabsorption, pointing toward pancreatic insufficiency, bile acid deficiency, or small intestinal mucosal damage.
- **Occult Blood**: Evaluates for microscopic or hidden blood. In *Grahani*, this test is usually negative unless there is concurrent inflammation or structural damage.
- **Reducing Substances**: Tests for the presence of unabsorbed sugars (like lactose or fructose) confirming carbohydrate malabsorption.

Microscopic examination

A microscopic examination of stool in patients presenting with *GrahaniRoga* symptoms generally yields the following features:

- **Undigested Food Particles**: The presence of undigested meat fibres (creatorrhoea) and plenty of vegetable cells/fibres indicates weak digestive fire (*Mandagni*) and impaired absorption.
- **Excess Fat Globules**: Visible fat globules (steatorrhoea) under the microscope signify a defect in the assimilation of fats, frequently associated with *Pittadhara Kala* (duodenum/small intestine) dysfunction.
- **Presence of Mucus**: While mucus is classically recognized in *Ayurveda* as *Ama* (undigested,

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toxic material) sticking to the stool, microscopically it may show increased mucous strands, epithelial cells, and occasional inflammatory cells.

- Pus Cells (WBCs) and RBCs: The presence of pus cells (e.g., 6 - 8 per high-power field) points toward inflammation or a low-grade infection. Red blood cells might be seen if there is associated mucosal ulceration or bleeding, which helps differentiate *Grahani* from inflammatory bowel conditions.
- Absence of Parasites: In pure functional *Grahani* (IBS), stool microscopy and ova/cyst tests usually come back negative for parasites, which helps practitioners rule out infective diarrhoea.

Laboratory testing

- Blood tests

- Comprehensive metabolic panel - electrolyte disturbances, hepatic function, renal function
- Complete blood cell count - contributes to evaluating anaemia.
- Albumin
- Vitamins (e.g., vitamin B12, folate, vitamin D)
- Iron panel (includes serum iron, total iron-binding capacity, ferritin)

Specific evaluation includes¹²:

- Fat malabsorption- Faecal analysis, Microscopic analysis, Blood lipid level after a fatty meal
- Protein malabsorption- Bile acid malabsorption, Secretin and other pancreatic test, Prealbumin
- Carbohydrate malabsorption- D-xylose tolerance test, Lactose tolerance test, Hydrogen breath test, Bile acid breath test

Table 1 Laboratory tests for Fat malabsorption

Faecal analysis	Microscopic analysis	Blood lipid level after a fatty meal
Steatorrhea	Sudan stain	Changes observed in LDL composition
Reference range: 1-5 g/24 h	No steatorrhea - Size ranging from 2-20 mm faecal fat output was 3 g/d	After single meals are in accord with the proposition that there is neutral lipid exchange in the postprandial period with triglycerol enrichment of LDL particle at the expense of cholesteryl esters.
Questionable: 5-7 g/24 h	Mild steatorrhea – same size ranging & faecal fat output 13g/d	The change in the fatty acid composition of LDL particles containing dietary fat.
Abnormal: >7 g/24 h	Moderate steatorrhea- size 30 mm faecal fat output 25g/d	
	Severe steatorrhea – numerous & larger fat droplets up to 90mm	
	Faecal fat output 64g/d	

Table 2 Laboratory tests for Protein malabsorption

Bile acid malabsorption	Secretin and other pancreatic test	Pre albumin
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Failure of absorption of bile acids by the distal ileum result in bile acid malabsorption into the colon

Secretin causes the pancreas to release a fluid that contains digestive enzymes. These enzymes break down food and help the body absorb nutrients. The secretin stimulation test is done to check the digestive function of the pancreas.

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Table 3 Laboratory tests for Carbohydrate malabsorption

D-xylose tolerance test	Lactose tolerance test	Hydrogen breath test	Bile acid breath test
D-xylose, a pentose, normally not present in urine, is given by mouth in doses of either 25 g or 5 g. Its excretion in a 5-hour urine sample and its levels in plasma at 1 and 2 hours are measured.	It measures the ability of intestine to break down a type of sugar found in milk & other dairy products like lactose. If body cannot break down this sugar then it is said to be lactose intolerance.	Ingestion of test doses of dietary sugars lactose, sucrose, fructose or sorbitol any production of hydrogen means that there has been problem with digestion or absorption of the test sugar.	Breathe tests - Tests that detect abnormalities of Carbon dioxide (CO ₂) and Hydrogen (H ₂) elimination in the breath due to abnormalities of digestion, absorption, or bacterial overgrowth.

Sigmoidoscopy or Colonoscopy – Visual examinations of the rectum and a portion or all of the large bowel (colon) performed with a scope. Usually done when there are alarm signs such as rectal bleeding or weight loss, or as part of diagnostic screening for colon cancer after age 50.

Sigmoidoscopy may show mucus covering the mucosa, but otherwise unremarkable. Examines the esophagus, stomach, and the duodenum (the exact anatomical site for *Grahani*). It helps rule out conditions like Celiac disease, peptic ulcers, or severe inflammation.

Colonoscopy is rarely required if possible large bowel motility studies may be done. Examines the rectum and large intestine. It rules out structural diseases like Ulcerative Colitis, Crohn's Disease, or polyps.

Limitations of Laboratory Investigations

- No laboratory test specifically diagnoses *Grahani*.
- Diagnosis remains primarily clinical in *Ayurveda*.

- Laboratory investigations mainly help exclude structural and organic diseases.
- Results should always be interpreted alongside *Ayurvedic* clinical assessment.

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DISCUSSION

Grahani is an abode of *Agni* and its main function is *AnnasyaGrahamat* (receiving the food) hence it is named as *Grahani*. *Vishamagni*, *teekshnagni* and *mandagni* are *grahanidosha* responsible for maldigestion and malabsorption.

Malfunction of secretory hormones, bile juice, pancreatic and intestinal enzymes. Hence its analysis can be carried out in laboratory ascribed to pitta component or *agni*. Evaluation of increase and decrease in secretion of above factors and motility tests like Antroduodenal or small bowel manometry can be carried out is ascribed to evaluation of *samanavata* component related to *Agni*. Nature of mucus, thickness and accumulation rate in each segment of GIT can be measured with micropipette technique under observation through a stereomicroscope is ascribed to evaluation of *kledakakapha* component related to *Agni*.

Laboratory investigations serve as supportive tools to exclude other gastrointestinal disorders and assess the patient's overall health status. Chronic *GrahaniRoga* often results in impaired digestion and absorption, leading to nutritional deficiencies. Tests such as complete blood count (CBC), serum iron, vitamin B₁₂, folate, serum albumin, and total protein help identify malnutrition and anemia associated with prolonged disease. CBC, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and stool microscopy help identify underlying infections or inflammatory bowel conditions that may mimic *GrahaniRoga*.

Stool examination provides valuable information regarding undigested food particles, occult blood, parasites, pus cells, fat globules, and microbial pathogens. These findings correlate with impaired digestive and absorptive functions described in *GrahaniRoga*.

Liver function tests (LFTs) and pancreatic enzyme assays may be indicated in patients presenting with chronic diarrhoea, steatorrhea, or digestive insufficiency to rule out hepatobiliary or pancreatic disorders.

Sigmoidoscopy and colonoscopy have a complementary rather than primary role in the evaluation of *GrahaniRoga*. Their principal value lies in differentiating functional gastrointestinal disorders from structural and inflammatory diseases, identifying complications, facilitating histopathological diagnosis when necessary, and improving the safety and accuracy of integrative clinical practice. Appropriate use of these endoscopic modalities strengthens both patient care and the scientific validity of clinical research on *GrahaniRoga*.

CONCLUSION

The diagnosis of *Grahani* is fundamentally based on *Ayurvedic* principles, particularly the assessment of *Agni*, *Ama*, *Doṣa*, and clinical manifestations. Laboratory investigations and modern diagnostic procedures serve as complementary tools rather than definitive diagnostic methods. Tests such as complete blood count, stool examination, biochemical investigations, endoscopy, colonoscopy, and imaging studies aid in differentiating *Grahani*

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from conditions such as inflammatory bowel disease, celiac disease, intestinal infections, and malignancies. They aid in identifying nutritional deficiencies, evaluating disease severity, excluding organic gastrointestinal disorders, and monitoring treatment outcomes.

An integrative diagnostic approach that combines classical *Ayurvedic* examination with evidence-based laboratory investigations enhances diagnostic accuracy and supports comprehensive patient management.

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