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ROLE OF TAKRARISHTA IN THE STATE OF MALABSORPTION

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ABSTRACT

Malabsorption is a condition that prevents the absorption of nutrients like proteins, fats, carbohydrates, vitamins and minerals through small intestine, which is clinically noted through varying symptoms like weight loss, abdominal cramps, steatorrhea, bloating, diarrhoea, occational constipation etc. Defective absorption is mainly due to a defective small intestine. In Ayurvedic concepts *Grahani* is an organ in *Annavaha Srotas* which can be correlated with the organ Small intestine, where *Agni* is present and is responsible for all sort of *Pachana, Grahana, Vivechana* and *Munjana* of digested materials. Defective *Grahani* leads to a condition of *Grahani Dosha* due to *Mandagni* and exhibits the symptoms like *Karshya, Gururvarcha Pravarthanam, Muhur Baddham Muhur Dravam* etc. Hence in such condition the *Mandagni* is to be corrected and one such formulation to correct *Mandagni* is *Takrarishta. Takrarishta* is a *Sandhana Kalpana*, mentioned in Caraka Samhitha *Grahani Roga Adhikara,* which is extensively used in almost all types of GI disorders. The main indications as per the formulation are *Gulma, Arsha, Shotha, Krimi, Prameha and Udara Roga*. The formulation contains *Takra* as *Dravadravya* along with *Prakshepa Dravyas- Ajamoda, Amalaki, Hareethaki, Maricha* and *Pancha Lavana,* hence the formulation is called as *Takrarishta.* This *Anagni Siddha Kalpana* is *Deepana, Rochana, Varnya, Triptikara and Vatanulomana*. All these properties do *Srotosodhana* and have good *Grahi Swabhava*. It seems much effective from mere malabsorption diseases to severe metabolic disorders. It proves its efficacy due to *Deepana, Pachana, Srotosodhana* and *Grahi guna* of *Takrarishta*. It also stimulates appetite by increasing digestive secretions.

KEYWORDS: *Malabsorption, Grahani, Mandagni, Takrarishta.*

INTRODUCTION

Malabsorption is a clinical condition that a person experiences due to the lack of absorption of macro as well as micro nutrients into the body through Small intestine. This condition may leads to further more severe disorders that affect the wellbeing of humans. In Ayurvedic concepts, *Grahani* is the place where *Grahana* and *Pakadhi Karmas* are taking place because of the *Agni* present here.[1] Any deviation in the normalcy of *Agni* can be considered as a pathological state and can be termed as *Grahani Dosha*,[2] among that *Mandagni Avastha* of *Agni* can cause the state of malabsorption. Hence such measures that improve the condition of *Agni* must be adopted to preserve the normalcy in digestion and absorption. One such Ayurvedic formulation that corrects the *Agni* is *Takrarishta*, mentioned in Caraka Samhitha *Grahani Roga Adhikarana.*

Other formulations named *Takrarishta* with slight variations are also available in other *Ayurvedic* classical texts. In *Caraka Samhitha Chikitsa Sthana*, two different types of *Takrarishta* are mentioned, one in *Grahani Chikitsa* and another in *Arsha Chikitsa. In Arsha Chikitsa, Acharya* mentions the method of preparation, *Aushada Sevana Kala* and its qualities. The same reference of *Takrarishta* in *Grahani Chikitsa* is also mentioned in *Bhaishajya Ratnavali, Chakradutta, Ashtanga Hridaya* and also available in AFI. One more reference with slight change in name of formulation and ingredients is mentioned in *Ashtanga Hridaya* and for purpose of identification it is named as *Hapushadhi Takrarishta.*[3]

Takrarishta is an *Anagni Siddha Asava* preparation that can be grouped under *Sandhana Kalpana,* which contains about 5-10% of self-generated natural alcohol that acts as a media to deliver water as well as fat soluble herbal components into the body by preserving all its properties. The main ingredient of the formulation is *Takra.* This article mainly describes how *Takrarishta* acts in the state of malabsorption.

MATERIALS AND METHOD

Literary review was done with Ayurveda classical texts along with some modern publications. The data were collected from *Caraka Samhitha, Ashtanga Hridaya, Bhaishajya Ratnavali, Chakradutta* and *Bhava Prakasha,* and these procured informations were analyzed with journals, Modern text books like Harrison's Principles of Internal Medicine, Textbook of general medicine, Essentials of medical physiology and along with some internet sources.

To know about pathology one must be familiar with physiology and factors behind the causation of pathology.

Anatomy and Physiology of small intestine[4,5]

Small intestine or small bowel is an organ in GI Tract extends from the pylorus to the ileocaecal junction, with approximately 6m long, where most of the end absorption of nutrients and minerals from food take place. It lies between stomach and large intestine and receives bile and pancreatic juice through the pancreatic duct to aid digestion.

After the digestion of ingested food in stomach, the food may enter in the upper, fixed part, called the duodenum which measures about 25cm in length and this is the place where more enzymes are added from the pancreas to digest macronutrients including proteins, carbohydrates and fats. It is the place where the absorption of some minerals like calcium, iron and magnesium take place. This is followed by a lower, mobile part, forming a very long convoluted tube.

The upper two-fifth of the mobile intestine is jejunum which provides largest surface area for absorption. Zn, water soluble vitamins and fat soluble vitamins gets absorbed here.

The lower three-fifth is ileum which has tight intercellular junctions, allowing it to efficiently absorb fluid. Final portion of ileum is terminal ileum where vitamin B12 and bile salts are absorbed. If any of the above said part gets affected with any causative factors then it may leads to the state of malabsorption.

Digestion is the process of converting complex food substance to simpler ones. As the food passes through the small intestine in duodenum, carbohydrates gets converted into glucose, fructose and galactose, proteins gets converted into Amino acids and fats get converted into fatty acids and glycerol by the action of bile, pancreatic enzymes and Succus entericus.

The function of digestive system will not end after the process of digestion; it is followed by absorption through villi. Mucous membrane of small intestine is covered by villi and microvilli. Villi and microvilli increases the surface area of small intestine, the larger the surface area the more absorption take place.

Each villus has a central core composed of one artery, one vein, a strand of muscle, a centrally located lymphatic capillary (lacteal) and connective tissues that add support to the

structures. The blood vessels transport proteins and carbohydrates absorbed by the cells of villi, while the lacteal absorbs droplets of emulsified fat (chyle). The muscle strand allows the villi to contract and expand; it is believed that these contractions empty the contents of the lacteal into larger lymphatic vessels and then it is circulated throughout the body and proper nutrition is provided.

Pathology of absorption – Malabsorption

The causative factors for malabsorption are[6]

1. **Infection:** Some sort of bacterial as well as viral infections in our gut causes inflammation in stomach and intestines and leads to malabsorption.
2. **Medication:** Prolonged use of antibiotics result in the destruction of intestinal flora and results in Malabsorption.
3. **Surgery:** the surgical removal of small intestine leads to less surface area to absorb nutrients and leads to malabsorption.
4. **Intestinal disorders:** Celiac disease, Crohn's disease, tropical sprue etc leads to a state of malabsorption.

Small intestine Vs Grahani

Grahani is defined as "*Pakvamashaya Madyasdham Grahani Sa Prakeerthitha". Grahani* is the part of Gastro Intestinal Tract that is located in between *Pakvashaya* and *Amashaya* with the function *Apakvam Dharayatyannam Pakvam Srijathi Parshvathaha"* and it provides seat for *Jataragni.*[7] By these references we can correlate *Grahani* with Small intestine. *Anala* which is having a seat on *Grahani* is the one responsible for all *Pakadahadi Karma*[8] and *Samana Vayu* near Agni, which moves around *Koshta* is responsible for the processes like *Pachana, Grahana, Vivechana* and *Munjana.*[9] which is similar to the functions of Small Intestine. *Grahani* because of its inter dependent relation with *Agni*, any pathological state to *Grahani* leads to the vitiation of *Agni* and vice versa. The pathological state of *Agni* is causing *Grahani Dosha* and *Mandagni Avastha* of *Agni* can be considered as the state of malabsortion.

Doshas and Digestion

According to Ayurvedic concepts, the well-being of human body is due to the equilibrium maintained by *Tridoshas*. *Doshas* involved in the process of digestion are *Samana Vayu, Pachaka Pitta* and *Kledaka Kapha*.

Samana Vayu controls all neurohormonal influences involved in digestion which includes the control of Enteric Nervous System and Parasympathetic Nervous System. Enteric Nervous System consist of sensory neurons called *Meissner's Plexus* which controls the secretion and motor neurons called *Myentric Plexus* which controls the gut motility.

Kledaka Kapha produces *Kledatva* or helps in the moistening of food thus facilitates the proper functioning of *Pachaka Pitta* or enzymes, which is responsible for dividing *Anna* into *Saara* and *Kitta Bhaga.* The *Samana Vayu* moves all over the *Koshta* and does *Grahana, Pachana, Vivechana* and finally liberates into their respective pathways *Munjana.*

Ayurvedic pathology

As fire needs air and fuel to burn, *Pachaka Pitta* needs *Samana Vayu* along with *Kledaka Kapha* and any derangement in this condition may leads to *Jataragni Mandhya* and results in various absorptive disorders or *Grahani Dosha.*

According to modern concepts,

The state of malabsorption is mainly due to[10]

i. Pancreatic exocrine insufficiency
ii. Impaired bile acid synthesis and secretion
iii. Global malabsorption
iv. Disturbed transit and bacterial overgrowth

i. Pancreatic exocrine insufficiency

Pancreatic enzymes along with proper motility and prior hydrolysis are essential for digestion and sufficient absorption of macronutrients to maintain energy supply. The motility and the secretion of pancreatic enzymes is maintained by *Samana Vayu,* and *Pachaka Pitta* represents the pancreatic enzymes, and the process of hydrolysis prior to the action of pancreatic enzymes is done by *Kledaka Kapha,* which leads to the improper digestion of fat as well as absorption of fat and that leads to steatorrhoea, weight loss, abdominal discomfort, bloating etc.

ii. Impaired bile acid Synthesis and Secretion

Bile acids support the emulsification of triglycerides and form micelle with fatty acids and monoglycerides to enable absorption and its derangement may leads to malabsorption and produces various malabsorption symptoms.

iii. Global malabsorption

Global malabsorption is mainly due to impaired small intestinal mucosal condition and leads to the condition of loss of functioning which alters absorption of macro and micro nutrients and shows symptoms like diarrhoea, weight loss, abdominal distention etc.

iv. Disturbed Transit and Bacterial overgrowth

Decreased luminal availability due to resection, over bacterial growth or any other causes leads to the state of malabsorption. The intestinal flora sustains its vegetation by utilising the remains of proteins, fats, carbohydrates after absorption. The impaired absorption of macronutrients cause excess availability of these nutrients to flora results in its over growth which further leads to the disturbed transit of substances that is causation of *Samana Vayu Vigunata* due to *Margavarodha.*

By ascertaining all the possible correlation with Ayurveda concepts we can say that in these cases there occurs *Samana Vayu Vigunata* which leads to the impaired secretion of less quality enzymes (*Pachaka Pitta)* along with deranged *Kledaka Kapha.*

Clinical features

In malabsorption syndrome the clinical features that are seen includes Diarrhoea, Steatorrhea, Abdominal distention, Abdominal heaviness, Foul smelling faeces, Weight loss, Weakness etc along with some psychological disturbances like anxiety, loss of confidence, irritability, disturbances etc due to intermittant diarrhea.[11]

The symptoms seen in the state of malabsorption can also be seen in the disease *Grahani* like *Karsya, Dourbalya, Muhur dravam Muhurbadham, Guru varcha pravarthanam* etc.[12] As told earlier *Grahani Doshas* are responsible for the disease *Grahani Roga. Grahani Dosha* is the pathological state of *Agni* especially *Mandagni.* The relation of *Grahani* and *Agni* leads to *Sthanika Dosha Dusti* and further deteriorates the normal functioning of *Grahani. "Durbalagni Bala Dusta Tu Aamameva Vimunjathi"* the affected *Grahani* will always expel the food without digestion and absorption as waste.[13]

Hence in such conditions, drugs having qualities *Deepana, Pachana, Kaphahara, Srotosodhana, Vatanulomana* and *Grahi* are required. One such formulation is *Takrarishta* which is evidently good with the ingredients as well as with the formulation.

Takrarishta

Takrarishta is an *Anagni Siddha Sandhana Kalpana* which contains *Prakshepa dravyas- Ajamoda, Amalaki, Hareethaki, Maricha and Pancha Lavana;* along with *Drava Dravya Takra* as main ingredient hence it is called *Takrarishta.* The main indications as per the formulation are *Gulma, Arsha, Shotha, Krimi, Prameha and Udara roga.*[14]

Ingredients and Quantity

Ajamoda – 3 pala

Amalaki - 3 pala

Haritaki – 3 pala

Maricha – 3 pala

Pancha Lavana (*Saindhava, Bida, Souvarchala, Samudra, Audbhida)* – 1 pala each

Takra – 1 Aadaka

Method of preparation

The *Prakshepa Dravyas Ajamoda, Amalaki, Haritaki, Maricha* are taken in equal quantity (3 palas) *and Pancha Lavana* (1 pala each – total 5 palas) are taken and made into fine powder individually. These powdered drugs are added one by one into *Takra* along with constant stirring. After adding all ingredients the liquid mixture will be poured into fumigated porcelain or mud pot, closed and kept for fermentation. Once fermentation gets complete open the seal, filter it and preserve.[3]

Presently this formulation is available in both *Choorna* as well as *Arishta* form with prescribed dose:

Takrarishta Choorna - 10-15g with *Takra* / water

Takrarishta (liquid) - 12-24ml with equal quantity of water

In *Caraka Samhita, Arsha Chikitsa, Takrarishta* is told to be consumed either in the beginning, middle or after food based on the condition of the patient.[3]

Importance of formulation

According to *bhava prakasha,*

The preparation may preserve the properties of *Beeja Dravya* for a long period. When *Madya* become *Purana* there may have a quality enhancement. It provides better taste, cures *Krimi, Sleshma, Anila etc* due to its *Srotosodhana Guna*. Fast action of drugs on target areas and provides its efficacy through *Vyavayi, Vikashi, Tikshna, Vishadha* and *Sookshma*

properties.[15]

Table no. 1: Properties of *prakshepa dravyas*.[16,17,18,19, 20-24]

Ingredients	Rasa	Guna	Virya	Vipaka	Karma
Ajamoda (*apium leptophyllum*)	*Katu tikta*	*Laghu ruksha*	*Ushna*	*Katu*	*Deepana*
Amalaki *(embelica officinalis)*	*Lavana varjitha pancharasa*	*Laghu ruksha*	*Sita*	*Madhura*	*Tridoshajit*
Pathya (*terminalia chebula)*	*Lavana varjitha Pancharasa*	*Laghu*	*Ushna*	*Madhura*	*Anulomana*
Maricha *(piper nigrum)*	*Katu*	*Laghu tikshna*	*Ushna*	*Katu*	*Kaphavatahnam*
Souvarchala	*Katu*	*Laghu sukshma*	*Ushna*	*Katu*	*Ruchyam, Deepana, Pachana*
Saindhava	*Lavana*	*Laghu snigdha*	*Sita*	*Madhura*	*Deepana, pachana*
Bida	*Kshara*	*Laghu, tikshna*	*Ushna*	*Madhura*	*Vyavayi, anulomana*
Audbhida	*Katu*	*Snigdha, guru*	*Sita*	*Katu*	*Vatahara*
Samudram	*Madhura tikta*	*Guru*	*Ushna*	*Madhura*	*Deepana*

The *drava dravya* used in the formulation *takrarishta,* have the qualities like[25]

Rasa: Kashaya Amlam

Guna: Laghu, Ruksha,

Virya: Ushna

Vipaka: Madhura

Karma: Grahi, Deepana, Vrishya, Vatakaphahara, Avipaki, Vikashi, Triptikaraka, Viryavardhaka also *Pittavarodhi (*will not aggravate *Pitta)*

Rogas: Sopha, Udara, Arshas, Grahani Dosha, Aruchi, Gulma, Pleeha, Pandu

Hence the formulation *Takrarishta* possess the qualities

Rasa: Amla Katu

Guna: Laghu, Vikashi, Sukshma

Virya: Ushna

Vipaka: Madhura

Karma: Deepana, Pachana, Srotosodhana, Rochana, Kaphavatanulomana, Grahi

RESULT

By viewing the above mentioned physiology and pathology, we can say that the state of malabsorption is a type of *Grahani Dosha* due to *Mandagni* and this decreased activity results in the destruction of intestinal flora. Hence here *Mandagni* is to be corrected with the administration of probiotics or prebiotics which is very much available in this formulation.

Grahani in physiological state provides functions like *Grahana, Pachana, Vivechana* and *Munjana* and its pathological state alters its normal functioning. Due to the affliction of *Grahana Karma,* symptoms like *Atisara* occurs and in such conditions the drugs having *Dipana, Pachana, Srotosodhana* with *Grahi* properties can be used.

If the *Pachana Guna* is affected either due to the increase in *Kledatva* of *Kapha* or *Dravata* of *Pitta,* symptoms like *Ajirna, Aruchi, Gururvarcha Pravarthanam* etc occurs and the drugs with *Ruchya, Deepana, Pachana Gunas* can be used.

When the *Vivechana* as well as *Munjana* is affected accompanied with decreased *Pachana,* produces different types of malabsorption symptoms like *Karshya, Dourbalya, Gurur Varcha Pravarthanam etc.* Hence to clear this entire problem *Mandagni* is to be rectified. For that the drugs having *Deepana, Pachana, Kaphavatahara, Srotosodhana* and *Grahi* properties need to be selected. There comes the importance of *Takrarishta,* not only due to the drugs used in the formulation but also the formulation *Asava* itself provides better benefits.

DISCUSSION

The state of malabsorption is mainly due to the *Mandagni Avastha* of *Grahani.* In the context of *Grahani Chikitsa, Acharya Vagbhata* said that the *Doshas* localised in the *Grahani* should be treated in the same way as treating *Ajirna* and *Atisara*. The treatment protocol must begin with *Langhana,* in the view that *Ama Pachana* must be done prior to the administration of other medicines. By doing such measures the *Ama Avastha* gets destroyed and the strength of digestive fire and body improves by its own. Hence apart from having *Langhana* alone, the formulations with *Deepana, Pachana, Srotosodhana* and *Grahi* properties can be adopted to strengthen the digestive fire and thus the underlying pathologies gets cured.

According to *Bhava Prakasha, "Takramamam Kapham Koshte hanti Kante Karoti Cha".* Uncooked *Takra* has the property to reduce *Kapha* in *Koshta.* Hence due to this property *Takra* produces *Rookshana* in *Koshta* and helps to cure the state of *Mandagni.* Apart from

that the properties of the drugs used in formulation along with *Takra* provides an added effect to cure this state.

The *Laghu, Rooksha Guna* of *Takrarishta* will help to decrease excess *Kledatva* of *Kapha* as well as the *Dravata* of *Pitta* which provides a good quality of *Pachaka Pitta* (bile, pancreatic enzymes and succus entericus) and facilitates the action of these enzymes after proper hydrolysis (*Kledatva* – the *Kleda amsha* of pancreatic enzymes makes the acidic chyme alkaline which is necessary for the action of bile*).* Thus the formed enzymes will convert the complex structures into simpler ones and makes it available for absorption. By having proper absorption of macro as well as micro nutrients many symptoms like weight loss, steatorrhea, weakness etc gets cured.

Deepana, Pachana, Srotosodhana and *Grahi Gunas* of *Takrarishta* facilitate the proper absorption of properly formed simpler substances after its digestion. The property *Vatanulomana* along with these properties of *Takrarishta* provides a proper action for *Samana Vayu* and thus regulates the well-functioning of gut motility and regulated secretion thus the symptoms like *Muhurdravam Muhurbaddham* etc gets reversed to a healthy condition.

The *Sarva Guna* of *Takrarishta* that is the formulation itself helps to increase the metabolic activity of body thus the metabolic disorders like *Prameha, sthoulya etc* gets cured.

According to *Caraka Samhitha, Takrarishta* can be consumed either in the beginning, middle or after food based on the condition of the patient. In *Kapha Udreka* condition it can be advised before food. In case *Samana Vayu* or *Pachaka Pitta* vitiation it can be administered in between food, because when the food get ingested the *Samana Vayu* and *Pachaka Pitta* gets stimulated and the administration of medicines at that time results in the direct action of medicine in vitiated *Samana Vayu* and *Pachaka Pitta.* If the person is *Sukumara* in physique, who could not tolerate the *Tikshnata* of medicine then it can be administered after food. *Paschat Bhakta Aushada Sevana Kala* is also indicated in those who required strength.

CONCLUSION

From ancient times, the process of fermentation is mainly done for the purpose of preservation. According to *Bhava Prakasha, Guna* of *Asava* is based on the *Beeja Dravya* used and the properties of these *Dravyas* are preserved for a long time. Thus we can say that

the formulation acts as a good preservative by preserving all its qualities for a long time and provides good results.

Modern researches states that fermented products have a flavor enhancement feature which is what stated by Acharya *Charaka* also. While explaining *Takrarishta* in *Arshas Chikitsa* it is been told that the *Dravadravya Takra* at the time of making this formulation have *Manda, Katu, Amla Rasa* and as fermentation takes place its *Rasa* will become more *Vyakta* and *Mukhapriyam* which shows the flavor enhancement property.

Now a day, use of probiotics for many conditions are common to maintain intestinal flora. Dairy products when gets fermented there forms lactobacillus as well as bifidobacterium which is used as a treatment for IBS and diarrhoea apart from that the loss of intestinal flora is one among the causes of malabsorption. This *Sandhana Kalpana* may acts as a probiotics and also helps to improve the nutritional quality. Thus apart from having *Deepana, Pachana, Srotosodhana* properties, *Takrarishta* helps to cure simple indigestion to varied metabolic disorders by correcting the basic pathology.

Hence we can say that malabsorption is a condition that can be well correlated with the *Mandagni* state of *Grahani Doshas.* Hence to cure this *Agni* is to be corrected. *Takrarishta* preserves all the properties of its ingredients including *Takra* and acts on the deranged *Agni* and produce *Vatanulomana, Kaphahara* without aggravating *Pitta* by the *Deepana, Pachana, Srotosodhana* and *Grahi guna.*

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