



Relation between Agni and Gut Microbiota

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Agni is the principal component of the living body. It is responsible for all kinds of activities happening inside the body; therefore, Ayurveda considers that Dehagni is the cause of life, complexion, strength, health, and nourishment and also responsible for the causation of disease. Gut microbiota, or gut flora, are the microorganisms, including bacteria, archaea, fungi, and viruses, that live in the digestive tract. Collectively, they create the network system with all organs called as gut axis, which has tremendous potential to influence human physiology in terms of health and disease. Disturbance in Agni due to improper diet, lifestyle, and stress contributes to the development of dysbiosis, leading to various organ system diseases. Ashtanaga Hridaya has quoted "Sarve Rogau Api Mandagnau." How Agni is responsible for manifestation of all diseases can be understood by analysing the relationship between Agni and the gut microbiota. Gut microbiota communicates with every organ system in the body via the gut axis; impairment in the Agni has a direct effect over gut microbiota, leading to gut dysbiosis, and that which disturbs the gut axis leads to disease manifestations. Here, an attempt is made to understand the relationship between Agni and gut microbiota.

Keywords: Agni, Gut microbiota, Gut health, Gut axis

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Introduction

Agni is a key component of our body's digestion and metabolism, according to *Ayurveda*. Food that has been consumed must be broken down, absorbed, and assimilated; this process is carried out by *Agni* and is necessary for life to continue. The term "*Agni*" in *Ayurveda* is used in the sense of digestion of food and metabolic byproducts. The state of *Agni* is believed to influence the balance of the three *Doshas* - *Vata*, *Pitta* and *Kapha* which are fundamental principles governing the physiological and psychological functions of the body in *Ayurveda*. The gut microbiota is the community of trillions of microorganisms that live in digestive tract, and they play a crucial role in maintenance of health. It is estimated that there are more **bacterial cells in gut than there are human cells in entire body**. These tiny organisms, though unseen hold immense power in influencing health and well-being. The location of *Agni* in *Ayurveda* coincides with the major site of gut microbiota, suggesting a connection between the two. There is a conceptual link between *Agni* and the health of the gastrointestinal system, which influences the function of gut microbiota.

Aims and Objectives

To understand relation between *Agni* and gut microbiota

Materials and Methods

Review of literature regarding *Agni* and Gut microbiota was done to analyse the relation between the concepts of *Agni* and Gut microbiota in available textbooks, research articles and various websites were reviewed.

Agni:According to *Acharya Charak*, if an individual's *Agni* is in the *Sama* stage, he or she will be perfectly healthy and will live a long, happy life. When the functioning of *Agni* ceases, an individual dies. But an individual's entire body's metabolism would be disturbed or thrown off balance if their *Agni* was vitiated, leading to poor health and disease. *Agni* is therefore referred to as the base (*Moola*) of life.[2]

Importance of Agni:*Agni* influenced *Bala* (strength), *Varna* (color), *Swasthya* (health), *Utsaha* (enthusiasm), *Upacaya* (body growth),

Prabha (complexion), *Ojas* (strength), *Tejas* (valour), *Vaya* (age), and even *Ayu* (life). So, as long as *Agni* remains normal, people can have a healthy and long life. If the functioning of *Agni* stops, it leads to a loss of life.[4]

The *Acharya Charaka* describes 13 types of *Agni*, including *Jatharagni*-1, *Bhutagni*-5, and *Dhatvagni*-7. *Jataragni*, which is located in *Amapakawashaya*, is considered superior because it plays a major role in digestion, metabolism, and other *Agni* functions that are dependent on *Jatharagni*, so in other words, *Jatharagni* can be taken as digestive fire produced by the gut for the purpose of digestion.

Gut:Gut is another name for the gastrointestinal tract. It is indeed a complex organ system with diverse functions and its health is closely linked to various aspects of overall well-being. The gut is often known as "The Second Brain" since it is wired similarly to the brain with neurons and neurotransmitters.[1]

To function normally, the gut is loaded with microorganisms known as microbiota, which helps in digestion, metabolism, and absorption of ingested food particles. The gut is the main location of the human microbiota.[3]

What is gut microbiota?

The gut microbiota refers to the complex community of microorganisms, including bacteria, viruses, fungi, and other microbes, that live in the digestive tracts of humans. This inhibits and maintains the homeostasis of gastrointestinal tract and also communicates with other organ systems of body to function normally through the axis, which is referred to as the gut axis. These axes play crucial role in various aspects of human health.

Gut axis:The term "axis" refers to a connection or line of communication between different components or systems. The term gut axis refers to the bidirectional communication and interaction between the gastrointestinal tract (gut) and other organ systems in the body.[5]

Here are some notable types of gut axis

1. Gut Brain Axis[5]
2. Gut Immune Axis
3. Gut liver axis
4. Gut endocrine axis
5. Gut skin axis
6. Gut bone axis

When gut homeostasis is maintained, the gut microbiota will function normally, and communication between the organ systems will be properly maintained by the gut axis. If gut homeostasis is disturbed, that leads to dysbiosis and hampers communication.

Gut dysbiosis: Gut dysbiosis is defined as an imbalance in the gut microbiota characterized by a decline in microbial richness and abundance, as well as the loss of beneficial bacteria such as Bacteroides and Firmicutes, and an increase in pathogenic bacteria such as Prevotellaceae and Enterobacteriaceae. This imbalance can have negative impacts on the host's health, including disorders of metabolism, endogenous intoxication, systemic inflammation, and decreased essential metabolites.[6]

Relation between Agni and Gut microbiota

Sarve Roga Api Mandagnau: In Ayurveda, it is believed that the root cause of all diseases is *Mandagni*, and that much importance is given to the *Agni* in our classics, as it is carrying metabolic activity including anabolism, catabolism, and transformation of food from *Sthula Dravya* to *Sukshma Dravya* and *Ahara Rasa* formation, segregating *Ahara Rasa* into *Poshaka* and *Poshya Bhava*, where *Poshaka Bhava* does the *Poshana* of the same *Dhatu* and *Poshya Bhava* does the *Poshana* of *Uttarottara Dhatu* by the influence of *Jatharagni*, *Bhutagni* and *Dhatvagni*. *Jatharagni* is the main principal substance responsible for disease and health; other *Agnis* (*Bhutagni* and *Dhatvagni*) and vital functions are all dependent on *Jatharagni*. Therefore, a healthy state of the body and a diseased condition are entirely dependent on the status of *Agni*. Ultimately, *Agni* has an impact on overall health status of an individual.

When Agni is impaired?

Digestive processes are compromised, leading to incomplete digestion and the formation of *Ama*. This *Ama* later on becomes pathogenic due to interaction with local *Doshas* called *Amadosha*; on further stasis, it becomes more toxic called *Amavisha*. When this *Ama* enters, the systemic circulation spreads throughout the *Srotas* and accumulates in the place where it gets *Khavaigunya*. This makes the seat for *Sthana Samshraya* of vitiated *Doshas*, Thus *Dosha Dushya Samurchana* occurs which results in disease.[7]

"All disease begins in the gut"

The statement "All diseases begin in the gut," often attributed to Hippocrates, the ancient Greek physician who is considered the father of Western medicine, reflects the understanding that digestive health is foundational to overall health.

The gut microbiota, which is made up of trillions of microorganisms that live in the gastrointestinal system, is important for digestion, nutrient absorption, and the control of many physiological functions. Dysbiosis, or imbalances in the gut microbiota, has been related to a range of health issues such as gastrointestinal disorders, autoimmune diseases, and metabolic disorders.

As Jatharagni is considered as a digestive fire. Here Agni in one or other way is having impact over Gut microbiota in following way;

Impairment in *Agni* leads to

↓

Formation of Undigested food particles and toxins, referred to as "*Ama*"

↓

Influence the gut environment and microbial composition may lead to changes in gut pH

↓

Can lead to an acidic environment

↓

Potentially affecting the growth and survival of different microbes

↓

Influencing the gut microbiota negatively, leads to gut dysbiosis

↓

When dysbiosis takes place the gut axis will automatically hamper with the all-organ system leading to various diseases

↓

By the above-described manner or way, we can understand that *Sarverogau Api Mandagnau* and All diseases begins in gut as they are interconnected with each other.

Discussion

According to Ayurveda, the seat of Agni is *Koshta* (*Amashaya*), and seat of microbiota is gut when we see, both are coincidentally residing in same seat i.e., Gastrointestinal tract (GIT). The main function of Agni is to digest the assimilated food (*Ahara*) into *Ahara Rasa*,

Which is then transformed into respective *Poshaka Bhava* by virtue of Agni (digestive fire) and does *Poshana* (supplies nutrients) of *Rasadi Dhatu* by this health of an individual, is maintained. Gut microbiota also has the same function, where it helps in secretion of digestive enzymes by doing so, it aids in digestion process through which nutrients are readily absorbed. It helps in metabolism of food articles by maintaining the gut environment and nourishes the body. This gut microbiota is connected to every organ system of body through gut axis, which maintains healthy communication between gut and specific organs.

Since gut microbiota is having role in process of digestion and maintenance of healthy organ systems like wise *Agni* in *Ayurveda* is having *Pachana* (Digestion) process by this helps in maintaining healthy *Sapta Dhatus* (*Rasadi Dhatus*) by doing *Poshana* of *Dhatus* by respective *Poshaka Bhava*.

As we all know *Sarverogau Api Mandagnau* means all diseases of body are caused by *Mandagni* (reduced digestive fire). *Agni* is *Moola* for all disease formation and as well as healthy status. Likewise, according to statement of Hippocrates "All diseases begin in the gut" gives information about the role of digestive fire and gut in formation of different diseases and maintenance of health.

Agni and gut microbiota are having interconnection where one entity is depending on another. Gut microbiota is if hampered then there will be no or improper production of digestive enzymes. *Agni* if hampered then there is no proper digestion and absorption of *Ahara*. Here we can infer the importance of Gut microbiota and *Agni* for maintenance of gut environment.

Conclusion

The relationship between *Agni* (Digestive fire) and gut microbiota is complex and interconnected. While *Ayurveda* and modern science use different terminologies, there is interest in understanding the principles of *Ayurveda*, particularly those related to *Agni*, align with the current understanding of the gut microbiota - the microorganisms residing in the gut.

Ayurveda associates different types of *Agni* with specific *Doshas*. Imbalances in *Agni* can contribute to *Dosha* imbalances,

And the altered *Dosha* state might influence the gut environment and microbial composition may lead to changes in gut pH and the overall environment, potentially affecting the growth and survival of different microbes leading to gut dysbiosis resulting in manifestation of disease.

By analysing seat and functions of *Agni* and gut microbiota, which are more similar, one can understand relation of *Agni*, its role in formation of *ama* which is a cause for formation different diseases in different parts of *Shareera* and role of gut microbiota in causation of health and disease formation when its environment is normal and altered. Gut axis, which connects different organ systems in body. When it gets hampered, it becomes reason for disease formation of the respective organ. Like this when *ama* is formed in *Amashaya* due to *Ahitakara Ahara* and *Vihara* causes *Agni Mandya* and then formation of disease. This shows importance of *Agni* and its role in maintenance of health and formation of disease.

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