

International Research Journal of Ayurveda & Yoga

Vol. 5 (6),77-81, June, 2022

ISSN: 2581-785X :<https://irjay.com/>

DOI: [10.47223/IRJAY.2022.5611](https://doi.org/10.47223/IRJAY.2022.5611)



Relation Between Gut Brain Axis and Agni

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Article Info

Article history:

Received on: 11-05-2022

Accepted on: 23-06-2022

Available online: 30-06-2022

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ABSTRACT:

"All diseases begin in the gut" - Hippocrates of Kos, this statement was made by Greek physician Hippocrates, regarded as the father of modern medicine¹; although the importance of *Agni* (the digestive fire) has already been sold by *Acharya charaka* when he states that "the cause of all diseases is *Mandagni*" It has become evident that the intestinal bacteria and flora can affect the central nervous system (CNS) physiology and has an important role to play in the pathological conditions of the same. The nervous system and the gastrointestinal tract are communicating through a bidirectional network of signaling pathways called the gut-brain axis, which consists of multiple connections, including the vagus nerve, the immune system, and bacterial metabolites and products. It is clearly visible in the case of psychosomatic disorders like Ulcerative colitis, etc. that Gut is affected by Brain and vice-versa.

Keywords: Gut-brain axis, Agni, Ayurveda, Gut microflora

INTRODUCTION

The intestinal microbiota plays a major role in host's physiological and pathological conditions. This microbiota consists of bacteria, viruses, fungi and bacteriophages. This composition of microorganisms can be influenced by different environmental and lifestyle factors through the lifetime, this Gut microbial alteration is also known as DYSBIOSIS, a condition associated not only with gastrointestinal disorders but also with diseases affecting other distal organs. Recently, it became evident that the intestinal bacteria can affect the central nervous system (CNS) physiology and inflammation. The **gut-brain axis** is the two-way biochemical signaling that takes place

between the gastrointestinal tract (GI tract) and the central nervous system (CNS)².

According to Ayurveda, the digestion, metabolism and assimilation of nutrients is controlled and regulated by *Agni*³. Hence, it can also be said that *Agni* is responsible for dysbiosis. The site of *Agni* is *Grahani* it is so called because of its power to retain the food, It is situated above the umbilical region and is supported and nourished by the strength of *Agni*. *Agni* in *Sama avastha* (balanced state) is responsible for *niroga avastha* of an individual while in *vaikrit avastha* (*vishama*, *teekshana*, *manda*) it is responsible for *roga utpatti*. Negative psychological states



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have a bidirectional impact on the body and, in particular, the homeostasis of *agni*. In other words, if *agni* is disturbed through physical means, such as eating foods which cause imbalance, then psychological difficulties like insomnia and disturbed thoughts will likely ensue. The same is true from a top-down perspective, implying that emotional imbalance caused by *rajas* or *tamas* can disturb *agni*, possibly leading to pathology⁴.

Communication between the Gut and Brain

The Gut Brain axis involves different pathways such as the autonomic and enteric nervous system, the endocrine system, the hypothalamic-pituitary-adrenal axis (HPA), the immune system, and the microbiota and its metabolites. Several neurotransmitters and metabolites such as essential vitamins, secondary bile acids, amino acids, and short-chain fatty acids (SCFAs), modulate many immune system pathways that in turn influence behavior, memory, learning, locomotion, and neurodegenerative disorders.⁵

Neurological Pathway

The neurologic pathway includes the Vagus nerve, the enteric nervous system, and the activity of neurotransmitters within the GI tract. Neurologic modulation of afferent sensory nerves directly produces molecules that can act as local neurotransmitters, such as GABA, serotonin, melatonin, histamine, and acetylcholine; this pathway also generates biologically active forms of catecholamines in the lumen of the gut⁶. These neurotransmitters affect the physiological working of gut.

Endocrine Pathway

The nutrient available in the gut can be altered by gut microbiota and these alter the release of biologically active peptides from endocrine cells present in the gut which in turn can affect the gut-brain axis. Now, if there is dysbiosis in gut it will have an impact on the enteroendocrine cells, which in turn will influence the gut-brain axis.⁷

Inflammatory Pathway

Inflammation metabolism within the GI tract is influenced by the gut microbiome, principally via the immune systems release of cytokines and other cellular communication mediators, such as interferon-gamma, during times of dysbiosis. In irritable bowel syndrome (IBS), as an example, abnormal microbiota populations activate mucosal innate immune responses, which increases gut epithelial permeability, activates gut pain sensory pathways, and dysregulates the enteric nervous system⁸

Role of Agni in Gut-brain axis

The bidirectional nature of the axis is crucial in understanding of *agni* as well. If *agni* (digestive fire) is

disturbed through physical means, such as due to *viruddha ahara*, etc. which cause imbalance of *doshas*, then a lack of positive emotion and disturbed thoughts will likely ensue. The same is true from a top-down perspective, implying that emotional imbalance can disturb the *agni*, possibly leading to pathology.

The role of *manasika nidana* in vitiation of *agni* has been clearly told by Acharyas.

Some of the factors mentioned in madhava nidana are:

Irshya – jealousy

Bhaya – fear

Krodha – anger

Lubdha – confused

Ruk nipidita – suffering from pain

Dainya nipidita – suffering from depression

*Pradvasha yukta – aversion to food*⁹

He also states that, Even if foods that are wholesome (Pathya) are consumed in proper quantities (matraya), it does not get digested if the person is suffering from

Chinta – worry

Shoka – grief

Bhaya – fear

Krodha – anger

These, *maansika karanas* have a direct impact on the normal functioning of *agni*, for example, a person with *ati krodhita* nature will have an impact on *Pitta dosha*, there will not be proper *pakaof* ingested *aahara* due to impairment of *agni* and this will lead to Dysbiosis, which will have an impact of pathogenesis of various disorders related to nervous system.

Along with the *maansika* factors other factors also play a role in disruption of normal working of *agni*, for example, an individual continuously adopting *ratrijagrana* in his lifestyle will have *vruddhi* of *vata dosha* in his body which will cause *vishamta* of *agni* and hence disrupt the gut microbiome, causing the dysbiosis and in turn playing a vital role in causation of mental disorders.

Example of a few diseases in which the gut affects brain and vice versa: -

1. Rasa Pradoshaja vikara- While mentioning the *nidana* for *rasavaha srotodushti*, Acharya Charaka has quoted " *rasvahini dushaynti chintyana chaatichitnaat* "¹⁰ which means that excessive stress and other psychological factors are responsible for *rasavaha srotodushti* and can cause

diseases related to *rasa dhatu* like *Jwara*, *Aruchi*, *Pandu*, *Agninasha*, etc.¹¹

2. **Bhayaja Atisara/Shokaja Atisara**- A simple example in which emotional state of a person can affect the Bowel movements in the person, even the treatment of these two aims at treating the cause of these, the patient suffering from diarrhea caused by fear (*Bhayaja*) is exhilarated, and the patient suffering from Diarrhea caused by *Shoka* (grief) is consoled for their cure.

3. **Grahani (IBS)**- Grahani is a disease for which Acharyas have described *Maansika nidana* as well, according to its symptoms it can be compared to IBS, there has been established the role of psychological factors as a cause of IBS.

The response to stress is mediated by corticotrophin releasing factor (CRF) secreted by the enteric neurons, enteroendocrine cells and immune cells. CRF binds to CRF receptors present on smooth muscle cells and increase the number of discrete cluster contraction.

Emotions significantly affects colonic response in IBS. Stressfull stimuli disrupt upper GI motility in several ways.

4. **Manovikara**- *Manovikaras* are classified into three types-

a) *Manoadhithana*

b) *Nanatmaja*

c) *Ubhayadhithana*

Here, *Ubhayadhithana* is again classified into two groups like based on the involvement of *Manas* as primary in first group and based on the involvement of *Sareera* as primary in second group, this classification itself is a proof to the argument that psychological factors have an impact on gut as well as *agni* and are involved in *samprapti* of somatic conditions, example *Kushtha*.¹²

5. **Unmada**- While mentioning the *nidana* of *Unmada*, *Aacharya Charaka* has first mentioned "*Viruddha, dushta, Ashuchi Bhojana*"¹³ this also acts as a *nidana* for *vikruti* of *agni*, which lead to the disturbances in *Sharirika* followed by *Manasika doshas*.

The above examples present evidence that *Ayurveda* as well as modern science have accepted the role of *Agni*/ Gut microbiome in the causation of various nervous system related disorders. Hence, it can be considered that *Agni* has a vital role to play in normal working of *maansika* and *sharirika doshas*, as well as it has a high level of impact in causation of *manorogas* too.

DISCUSSION

The role played by the Gut and the enteric nervous system in the maintenance of homeostasis of nervous system and body cannot be ignored, although this field requires extensive research in order to properly and deeply understand this topic but there is proof of relationship in working of between gut microbiome and brain.

Agni is a much broader concept as compared to gut microbiome and it will not be false to state that maintaining homeostasis of gut and gut microbiome is one amongst the many functions of *agni*.

Agni in its normalcy helps in maintaining the physiological state of microbiome of gut, while *Teekshna agni* may be directly proportional to gut microbiome and hence lead to increase in the number of microorganisms present in the gut, this may be validated by the increased metabolism in people with *Teekshna agni*, on the other hand a person with *Manda agni* will have decrease in the number of microorganisms present in the gut.

A comparison between pathogenesis of disease caused by involvement of gut brain axis and *agni*: *Flow Chart*

CONCLUSION

To conclude the above discussed facts and findings, it can be stated that the *agni* and gut microbiome have a vital role to play in the homeostasis and healthy functioning of nervous system as well as in maintaining the behavioral and psychological homeostasis of the body. *Agni*, although is an individual entity but has an influence over various factors such as *Sharirika* and *Maansika doshas*, *Aama*, *Aahara Paka*, etc. so one must be very careful about the proper working of their *Agni*. Hence, it is rightly said by *Aacharya Charaka*, "Without *Agni* there is nothing left in the body"

Acknowledgements- Nil

Source of support: Nil

Conflict of interest: Nil

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REFERENCES

1. Lynch SV, Pedersen O.. The human intestinal microbiome in health and disease. *N Engl J Med* 2016;375:2369–79.
2. Sudo, N; Chida, Y; Aiba, Y (2004). "Postnatal microbial colonization programs the hypothalamic-pituitary-adrenal

- system for stress response in mice". *J Physiol.* **558** (1): 263–275.
3. Divya K., Tripathi J.S., Tiwari S.K. Exploring Novel concept of *agni* and its clinical relevance. *Altern Integr Med.* 2013;02(08)
 4. Tiwari M. Lotus Press; Twin Lakes, WI: 1995. *Ayurveda secrets of healing: the complete Ayurvedic guide to healing through Pancha Karma seasonal therapies, diet, herbal remedies, and memory.*
 5. Wang, Y; Kasper, LH (May 2014). "The role of microbiome in central nervous system disorders". *Brain Behav Immun.* 38: 1–12. doi:10.1016/j.bbi.2013.12.015. PMC 4062078. PMID 24370461
 6. Rutsch A, Kantsjö JB and Ronchi F (2020) The Gut-Brain Axis: How Microbiota and Host Inflammation Influence Brain Physiology and Pathology. *Front. Immunol.* 11:604179. doi: 10.3389/fimmu.2020.604179
 7. Mayer EA, Savidge T, Shulman RJ. Brain-gut microbiome interactions and functional bowel disorders. *Gastroenterology.* 2014;146:1500-1512.
 8. Azzam I, Gilad S, Limor R, Stern N, Greenman Y. Ghrelin stimulation by hypothalamic-pituitary-adrenal axis activation depends on increasing cortisol levels. *Endocr Connect.* 2017;6(8):847-855.
 9. Dupont HL. Review article: Evidence for the role of gut microbiota in irritable bowel syndrome and its potential influence on therapeutic targets. *Aliment Pharmacol Ther.* 2014;39:1033-1042.
 10. Shastry S; Madhavanidana with madhukosha Sanskrit commentary by Sri Vijayarakshita and srikantadatta, Varanasi Sanskrit; ed 2006, Chapter 6/7-8, pp183.
 11. Tripathi B, Charak samhita, Maharshi charak, vimanshthan, chapter 5, verse no. 21, Chaukhamba surubhi Prakashan, Varanasi, 2011
 12. Acharya YT, Charak Samhita of Agnivesa, with Ayurvedadipika commentary by sri Chakrapanidatta Sloka [Ch.Su.28/9-10]; Varanasi; Chaukhamba Surbharati Prakashan; 2013.pp.179.
 13. Acharya YT, Charak Samhita of Agnivesa, with Ayurvedadipika commentary by sri Chakrapanidatta Chikitsa Sthana,Ch-9,Sloka-5.Varanasi, Choukambha Krishnadas Academy, Varanasi, reprint-2015,pp: 738

How to cite this article: Chande A, Acharya S, Changath S "Relation Between Gut Brain Axis And Agni"
IRJAY.[online]2022;5(6);77-81.
Available from: <https://irjay.com>
DOI link- <https://doi.org/10.47223/IRJAY.2022.5611>

Flow Chart A comparison between pathogenesis of disease caused by involvement of gut brain axis and *agni*:

Gut-Brain axis

Lifestyle, dietary and environmental causes associated causes dysbiosis
↓
Microbial dysbiosis in GI tract
↓
Inflammatory response of gut
↓
Increased permeability of toxins
↓
Diseases (somatic and psychological)

Agni

Nidana Sevana
↓
Vitiating of *Dosha*
↓
Formation of *Aama*
↓
Localization of vitiating *dosha* and *Aama*
↓
Disease