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REVIEW ARTICLE

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REVIEW ARTICLE: SIGNIFICANCE OF AGNI IN IMMUNITY

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Abstract

In *Ayurveda*, man is considered as a replica of the universe. The basic principles of *Ayurveda* are greatly different from the basic Sciences like *Triguna*, *Tanmatra*, *Panchamahabhuta*, *Tridosha* and *Agni*. The person is said to be *Swastha*, only when equilibrium of *Dosha*, *Agni*, *Dhatu* and *Mala* along with pleasantness of *Atma*, *Indriya* and *Manas* are maintains and in balanced state. *Ayurveda* deliberates extensively on positive health measures such as life-style management, healthy dietetics which will help to maintain *Agni* upon which that equilibrium of *Dosha*, *Dhatu* and *Mala* of body are dependent and therefore conservation of health and prevention of disease. *Jatharagni* is the main principle substance responsible for disease and health. Any abnormality in *Agni* will evolve in the *Rasavaha Srotas* and as a result, disease manifests. Immunity is intrinsic to life and an important tool in the fight for survival against pathogenic microorganisms. To preserve health, one has to have a strong immunity to combat deadly etiological agents. To enhance immunity we need to know the importance of protecting and maintaining *Agni*. So, one should protect his *Agni* for improving his immunity against diseases by adapting proper dietary and lifestyle habits.

Keywords: *Agni*, *Pitta*, *Jatharagni*, *Bhutagni*, *Dhatvagni*, Immunity, Innate immunity, Acquired immunity, *Vyadhikshamatwa*

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INTRODUCTION

In *Ayurveda*, man is considered as a replica of the universe. Whatever is found in the universe is present in human body also. This living body which is made up of *Panchamahabhuta* will undergo *Chaya* and *Apachaya*. The term *Shareera* itself refers to one which deteriorates or the one that undergoes catabolic changes. For the constant process of change either catabolism or anabolism, an inherent factor exists, termed as *Agni*. It is responsible for all biochemical transformations in the body. It is the prime and ultimate in the process of maintenance of life^[1].

The basic principles of *Ayurveda* differ from the Basic Science and the understanding of the structure and function of human body, the pathology and diagnostics are based on its own theories of *Triguna* (Sattva-Raja-Tama), *Tanmatra*, *Panchamahabhuta*, *Tridosha* (*Vata-Pitta-Kapha*) and *Agni*.

Food consumed by a person is to be digested, absorbed and assimilated, which is essential for the maintenance of life, and is performed by *Agni*. It converts food in the form of energy, which is responsible for all the vital functions of our body. *Acharya Charaka* mentions that after stoppage of the function of *Agni*, the individual dies, and when the *Agni* of an individual is in equilibrium state, then that

person would be absolutely healthy and would lead a long, happy, healthy life. But, if the *Agni* of a person is vitiated, the whole metabolism in his body would be disturbed, resulting in ill health and disease. The person said to be *Swastha* only by maintenance of equilibrium of *Dosha*, *Agni*, *Dhatu* and *Mala* along with pleasantness of *Atma*, *Indriya* and *Manas*. Hence, *Agni* is said to be the base of life^[2].

Agni is basically divided into three categories: *Jatharagni*, *Bhutagni* and *Dhatvagni*. *Jatharagni* is also named as *Kayagni*, *Kosthagni*, or *Pachakagni*. Among these *Agni*, *Jatharagni* is the prime one and nourishes the other *Agni*. It refers to the whole process of digestion in gastro-intestinal tract (G.I.T). *Bhutagni* refers to final digestion and *Dhatwagni* refers to tissue metabolism^[3].

Acharya Charaka states that most of the diseases develop due to deranged state of *Agni*. Immunity is a biological term that describes a state of having sufficient biological defences to avoid infection, disease or other unwanted biological invasion. Immunity involves both specific and nonspecific components. The nonspecific components act either as barriers or as eliminators of wide range of pathogens irrespective of antigenic specificity. Other components of the immune system adapt themselves to each new disease encountered and are able to generate

pathogen-specific immunity. In view of the immune status of an individual being an important factor for conservation of health and prevention of disease, *Ayurveda* deliberates extensively on positive health measures such as life-style management, healthy dietetics which will help to maintain *Agni* through that equilibrium of *Dosha*, *Dhatu* and *Mala* of body^[4].

DISCUSSION

Physiological aspect of *Agni*

Main principle of treatment of all diseases as per *Ayurveda* is to restore and to strengthen the *Agni*. It literally means a factor which is capable of penetrating into minute spaces or which brings changes in a substance. It comprehends various factors that participate and regulate the course of digestion and metabolism or any transformation in the tissue of an organism^[5]. The term metabolism is used to refer to all the chemical and energy transformations that occur in the body, which is nothing but the function of *Agni*^[6].

Agni is influenced by the *Dosha* and results in *Vishamagni* (irregular digestive capacity), *Tikshanagni* (intense digestive capacity), *Mandagni* (low digestive capacity), and *Samagni* (normal digestive capacity). The *Samagni* is an indicator of health in an individual, it helps that all the food materials entered into gastrointestinal tract are digested properly so as to assimilate and

produce *Dhatu* uniformly. *Vishamagni* is vitiated by *Vata Dosha* and becomes irregular in nature, sometimes digests the food quickly and sometimes slowly. *Tikshanagni* is vitiated by *Pitta Dosha*. It is a state of very quick digestion of food, regardless of the type of food. *Mandagni* is diminished digestive capacity due to *Kapha Dosha*. Those who are having *Mandagni* eat very little and are unable to digest the smallest amount of food^[7].

Agni is a form of energy which is produced by various organelle under influences of many exogenous and endogenous factors to yield energy either to store (growth/anabolism) or expand (function/catabolism) for the purpose of survival of human being^[8]. So, all the functions attributed to the *Agni* can be summed into two aspects - *Dhatu nirmana* (tissue formation) and *Dhatu karma* (tissue function). Where the first is storage of energy, anabolism for growth and the second is of yielding the energy by catabolism^[9]. *Agni* implies a form of energy and it is always a functional unit, not a structural one^[10].

Normal physiological functions of different types of *agni*

Consumption of food may be in various forms like eatables, beverages, linctuses and masticable, that is wholesome if consumed in suitable quantity and free from contamination. These substances undergo metabolic transformation at various levels by the effect

of *Jatharagni*, *Bhutagni* and *Dhatvagni*. Initially *Jatharagni* gives stimulation to *Bhutagni* because consumed food is *Panchabhautika*, it has to undergo transformation by the respective *Bhutagni*, and then it becomes easy for tissue metabolism by *Dhatvagni*. Then processed metabolic products circulate inside the Srotas continuously by the help of *Vata Dosh*. This favours the development, strength, complexion and happiness as well as growth of tissues. *Dhatu* remain in their normalcy after receiving respective nutrients from metabolized food substances^[3].

Jatharagni is the prime *Agni* that nourishes the other *Agni*. It refers to the whole process of digestion in digestive tract. *Jatharagni* converting the gross food particles into smaller particles which are then able to be absorbed^[11]. It is also responsible for separation of the food material into *Prasada Bhaga* (the essence portion) and *Kitta Bhaga* (the waste products) in our body^[12]. The *Prasad Bhaga* once again gets divided into 3 portions. The first portion forms the *Sthanika Dhatu* (Local tissue). The second portion forms the *Poshaka Dhatu* (The supporting tissue or tissue responsible in the formation of its subsequent *Dhatu*). The third portion helps in the formation of *Upadhatu* (sub-tissues). The *Kitta Bhaga* gets eliminated as tissue wastes and is finally eliminated from the body after joining the main metabolic wastes of digestion.

Dhatvagni refers to tissue metabolism. The nutrients digested and absorbed by the *Jatharagni* are then sent to their respective areas. Each *Dhatu* is having different *Dhatvagni* to digest and thus absorbing the nutrients supplied. *Dhatvagni* is important factor for the maintenance and growth of the *Dhatu*. It is having mainly two functions. One is synthesis of new tissue. Second is to yield energy for the function of tissue. If *Dhatvagni* is hampered both of these functions will impair^[13]. The role of *Dhatvagni* is real important when it comes to treat various chronic illnesses.

Bhutagni digest their own part of the element present in the food materials. After the digestion of food by the *Bhutagni* all the exogenous substances become endogenous. Thus cause appropriate nourishment of body^[14]. The food that consumed by human being is *Panchamahabhoutika* (with five elements). Thus to digest food into energy there is requirement of respective *Bhutagni* which help to digest all elements in the simplest form in our body to provide the energy and strength.

INTERRELATIONSHIP BETWEEN THE TERM *PITTA* AND *AGNI*

The term *Pitta* is derived from the root '*thap*' which means combustion or digestion, required to nourish the body by digestion of ingested food, to maintain heat, to maintain

the colour, lustre of the body^[15]. There are difference of opinion exist regarding *Pitta* and *Agni*. Some *Acharya* consider *Pitta* to be *Agni* while other speaks differently.

As per *Acharya Sushruta*, *Agni* is not existed in the body without *Pitta*, because when the properties of *Agni* is diminished, the use of substances of similar properties have been given and when the properties are greatly increased, resorting to cold treatments have been suggested^[16]. According to *Hemadri*, *Pitta* is of five types, which are located between the *Pakvashaya* and *Amashaya*, although it is composed of *Panchabhuta* because of predominance qualities of *Tejas bhuta*, it is devoid of *Dravamsha* (although it is a liquid). Also, because it does not possess *Snigdha* (viscosity), *Shita* (coldness) and such other properties of *Aap mahabhuta*, it is called by the term "*Anala*" because of its function of *Paka*^[17]. . In *Charaka Samhita*, While discussing about *Pitta* in *Vatakalakaliya*

Adhyaya there is different opinions of other *Acharya* also mentioned. *Acharya Marichi* emphasized that the *Agni* present in the *Pitta* gives good or bad results when it is normal or vitiated. *Chakrapani* has commented on "*Pittantargata*", that the function of *Pitta* inside the body is not combustion but its work is to provide heat of *Agni*^[18].

Various examples have been quoted in classics to indicate that *Pitta* is *Drava* form of *Agni*. But, some doubts arise behind the concept of whether *Pitta* is *Agni*. Appropriate example to highlight the above concept is that 'ghee alleviates *Pitta* but enhances *Agni*' .The quotation of *Acharya Sushruta*, '*Samadosha Samagnishcha*' has clearly indicated that *Pitta* and *Agni* are not one and the same.

Types of *agni* and enumeration

Agni is innumerable because of its presence in each and every *Dhatu Paramanu* (cell) of the body. But, enumeration of the number of *Agni* varies in various classical *Ayurvedic* texts.

Table no. I Types of *Agni* according to different *Acharya* ^{[19, 20, 21, 22].,}

<i>Charaka Samhita</i> (13)	<i>Sushruta Samhita</i> (5)	<i>Ahtanga Hrudaya</i> (19)
<i>Jatharagni-1</i>	<i>Pachakagni</i>	<i>Audaryagni-1</i>
<i>Bhutagni-5</i>	<i>Ranjakagni</i>	<i>Bhutagni-5</i>
<i>Dhatwagni-7</i>	<i>Alochakagni</i>	<i>Dhatwagni-7</i>
	<i>Sadhakagni</i>	<i>Doshagni-3</i>
	<i>Bhrajakagni</i>	<i>Malagni-3</i>

Sharangadhara has recognized five *Pitta* only (*Pachaka, Bhrajaka, Ranjaka, Alochaka and Sadhaka*)^[23]. *Bhavamishra* has followed *Acharya Charaka* and *Vagbhata*. *Agni* has been divided into 13 types according to the function and site of action. These are (a) *Jatharagni*– One *Agni* present in the stomach and duodenum (b) *Bhutagni* – Five *Agni* from five basic elements (c) *Dhatwagni* – Seven *Agni* present, one in each of the seven *Dhatu*.

Anatomical location of *agni*

Grahani

According to *Charaka Samhita* *Grahani* is the seat of *Agni* and it is situated above *Nabhi*. It retains food for proper digestion and assimilation. It is not only seat of *Agni* but also supported and strengthened by *Agni*. In *Sushruta Samhita* the sixth *Kala* is described as *Pittadhara Kala* and situated between *Amashaya* and *Pakwashaya* and it is named as *Grahani*. As per Prof. Dhamodar Sharma Gowda, *Grahani* may be called as *Agnisthana, Agniadhishtana, Agnyashaya, Anthrani, Antrashaya, Kshudrantra, Kshudrantravayava grahani, Grahaninadi, Tejapata, Dahanashaya, Pakwamasahayamadhyam, Pachyamanashaya, Pachakashaya, PittadharaKala, Pittashaya*^[24].

Anatomically *Grahani* is situated (1) above *Nabhi*(2) between *Pakwashaya* and *Amashaya*(3) at the gate of *Pakwashaya*(4) it is

like membrane. *Grahani* with help of *Agni* holds undigested food and pushes forward digested food, but when *Agni* become vitiated and weak it vitiates *Grahani* and release food in form of *Ama* and produce diseases^[24].

Pittadhara kala

The act of ingestion of food itself involving its transportation to *Urdhwamashaya* and *Adhoamashaya* and propulsion of *Anna-Kitta* to *Pakwashaya* and *Annapachana* which is carried out under influence of *Samana Vayu*. *Sushruta* and *Vagbhata* opines this *Kala* as *Pittadhara Kala*. It provides digestive juice collectively called *Pachakagni* or *Jatharagni*. This not only does digestion but also *Sara Kitta Vibhajana* of food^[25].

Agni and metabolism

Metabolism is the sum of the chemical reactions that take place within each cell of a living organism and that provide energy for vital processes and for synthesizing new organic material^[26]. *Agni* converts food in the form of energy, which is responsible for all vital functions of our body. *Agni* is the invariable agent in process of metabolic transformations. It is the substance responsible for digestion and metabolism.

Factors causing vitiation of *agni*

(1) Dietetic indiscretion– excessive fasting, over eating, irregular eating, heavy, cold, dry, dehydrated, putrid food, excess liquid intake

(2)Dietetic incompatibilities – Diet not compatible to habitat, climate, body constitution, digestive capacity, combination, quantity etc. (3)Improper administration of Shodhana therapies especially *Vamana*, *Virechana*, *Vasti*, *Snehana*(4)Suppression of manifested natural urges (5)Sedentary lifestyle (6)Psychological factors – Mental tensions, emotional instabilities like anger, anxiety, fear, lust, greed, jealousy, depression etc.(7)Incompatible activities – Exercise after *Snigdha* (unctuous) diet, exercise or sexual indulgence during indigestion (8)Unhygienic conditions and emaciation as a result of chronic disease affliction^[5].

Agni vitiation: cause for disease

Normalcy of body is managed by well maintained *Agni*. Except *Samagni* remaining three types of *Agni* causes development of diseases.

Vishamagni is influenced by *Vatadosha* and hence is unpredictable in nature. When it is not digesting food properly, it produces flatulence, colic pain, heaviness, upward movement of *Vayu*, diarrhoea, heaviness and gurgling sound in the abdomen and tenesmus^[27]. If a person suffers from these discomforts even after consuming regular and measured food, then the *Agni* is thought to be *Vishamagni*. It creates different types of *Udaragata Roga*.

Teekshanagni will digest even large amount of food quickly. It is capable of tolerating all types of irregularities in diet. If the intensity of *Teekshanagni* is high and sufficient food is not supplied, it causes tissue destruction. Further, it has three varieties based on its degree of intensity viz., *Teekshna* which digests the food quickly; *Atyagni* or *Basmaka* caused by not levelling *Teekshanagni*, *Teekshnatama* is the effect of not levelling *Atyagni* where the person is never satisfied with the quantity of food consumed. This produces burning sensation, dryness in throat, palate, lips and pyrexia^[27].

In *Mandagni*, The strength of *Agni* is mild in this state. So even slightest variation in regular amount is felt heavy for its capacity of digestion impairing the functions of *Agni*. It is unable to digest small amount of food; creates heaviness in abdomen and head, cough, dyspnoea, excessive salivation, vomiting, pain all over body^[27]. Almost all diseases are due to *Mandagni* especially *Jwara*, *Udara roga*, *Arsha*, *Atisara*, *Grahani roga* etc.

When the *Agni* becomes weak, due to improper digestion *Ama* produced in the body. *Ama* on further stasis attains toxic qualities, vitiates *Dosha* and cause *Srotorodha*. This blockage of channels are the commonest factor in the manifestation of any disease.

This entire pathological event impairs process of digestion and absorption, thereby causing

various gastrointestinal disorders like *Hrillasa* (nausea), *Chardi* (vomiting), *Amlapitta* (acid peptic disease), *Atisaara* (diarrhoea), *Visuchika* (gastroenteritis), *Alasaka* (intestinal obstruction due to acute indigestion) etc. Further the *Ama* enters the circulation i.e. it impairs the *Bhutagni* due to its *Gurvadi* properties, and reduces its function. Due to *Bhutagni* impairment, the *Vijatiya* (heterogenous) Ahara rasa will not be able to become *Sajatiya* (homogenous) and act as antigen in circulation, thus causing anaphylactic reaction and allergic disorders like urticaria, hay fever, allergic rhinitis, etc^[28]. Again, the by-products like lactic acid, ketones etc. which does not attain finality in the metabolic process due to hypofunctioning of *Bhutagni* and *Dhatvagni* lead to disorders like *Madhumeha* (diabetes mellitus), *Medoroga* (obesity and dyslipidemia), *Vatarakta* (gout), *Amavata* (rheumatoid disease)^[29]. Free radicals may also be considered as *Ama* substance in circulation as it does not undergo final change in configuration thereby causing damage to proteins, vitamins and lipids. All hormonal and enzymatic deficiencies like hypothyroidism may also be considered to occur due to hypo functioning of *Dhatvagni*. So, most of the diseases like gastrointestinal disorders, allergic and auto-immune diseases, and various metabolic disorders have hypo

functioning of *Agni* and *Ama* formation as primordial factor in their manifestation^[5].

Role of *agni* in improving immunity

Immunity is intrinsic to life and an important tool in the fight for survival against pathogenic microorganisms. The human immune system can be divided into two major components: the innate immune system and the adaptive immune system. *Sahajabala* may be correlated to innate immunity. The innate immune system provides the rapid triggering of inflammatory responses based on the recognition (at the cell surface or within cells) of either molecules expressed by microorganisms or molecules that serve as "danger signals" released by cells under attack. These receptor interactions trigger signalling events that ultimately lead to inflammation. Virtually all cell lineages (not just immune cells) are involved in innate immune responses; however, myeloid cells (i.e., neutrophils and macrophages) play a major role because of their phagocytic capacity^[30]. *Yuktikritabala* may be correlated to adaptive immune system. The adaptive immune system operates by clonal recognition of antigens followed by a dramatic expansion of antigen-reactive cells and execution of an immune effector program^[31].

Agni is responsible for strength, health, longevity and vital breath. For this reason it should be protected by proper intake of food

and drinks because these act as a fuel. When deprived of food and drink, *Agni* becomes disturbed. *Jatharagni* is the main principle substance responsible for disease and health. During its normalcy it is responsible for longevity, complexion, strength, health, enthusiasm, build, luster, immunity (*Ojas*), temperature, additional *Agni* (*Bhutagni* and *Dhatvagni*) and other vital functions. Any abnormality in *Agni* will evolve in the *Rasavaha Srotas* and as a result, disease manifests like clouds in the sky that bring rain. In the same way abnormality in *Dosha* also manifests diseases. *Jatharagni* is the chief among all the *Agni* because the functions of *Bhutagni* and *Dhatvagni* are dependent upon *Jatharagni*. Aggravation or diminution of *Jatharagni* results in aggravation or diminution of *Bhutagni* and *Dhatvagni*. Therefore by all means, if one wishes for longevity and strength, one has to protect *Jatharagni* by consuming a suitable wholesome diet with a healthy lifestyle. Irregular digestion and metabolism causes imbalance in the *Dhatu*^[31]. Most of the diseases develop due to deranged state of *Agni*. So, one should protect his *Agni* for improving his immunity against diseases by adapting proper *Ahara* and *Vihara*.

General management of *agni* vitiation

Dietic managements like taking wholesome food, following *Ahara Vidhi Visheshayatana*, eating food on timely interval, select food

according to body type and *Agni*, eat until satisfied, always consume fresh foods, include *Shad rasa* (6 tastes) in food. Avoid over eating, in between snacks, fried packed foods, Fastfood, Ice and cold beverages, untimely large quantity food. Follow *Dinacharya*, *Ritucharya*, *Vyayama* according to strength of body, *Pranayama*, and *Asana* which improves digestive capacity etc. Avoid *Divaswapana*, *Ratrijagrana*, Sedentary life style etc. If *Agni* is vitiated first line of management should be *Agni Deepana* and *Ama Pachana* Then according to disease condition one should undergo *Shamana* and *Shodhana Chikitsa*.

Conclusion

Concept of *Vyadhikshamatwa* (immunity) has been described in *Ayurvedic* texts because the main goal of *Ayurveda* is to optimize the health an individual and cure disease. To preserve health, one should have a strong *Vyadhikshamatwa* to combat deadly etiological agents. It can be achieved by two means i.e. innate immunity and Aquired immunity. Factors like *Sahajabala* (natural strength), *Swabhavasamsiddhi* (natural factors), *Bijakshetragunasampaccha* (inherent qualities) decide the nature of innate immunity. Acquired immunity means the human body has the ability to develop extremely powerful specific immunity against individual invading agents such as bacteria, viruses, toxins, or even impure foreign tissues

from other animals. In contemporary pandemic situation it is necessary to enhance the *Vyadhikshamatwa* of an individual to become resistant to any etiological agents.

To enhance our innate immunity we need to know the importance of protecting and maintaining *Agni* by proper *Ahara* and *Vihara*. Most of the diseases occur due to deranged *Agni*. One should protect his *Agni* to avoid occurrence of disease. Otherwise disease occur also initial line of treatment in such conditions is administration of *Pachana* (which digests *Ama*) drugs followed by *Deepana* (which improves *Agni* strength) drugs to digest the existing *Ama* and ignite *Agni* followed by disease specific treatment if required. So diseases show marked improvement when the strength of *Agni* is increased.

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