



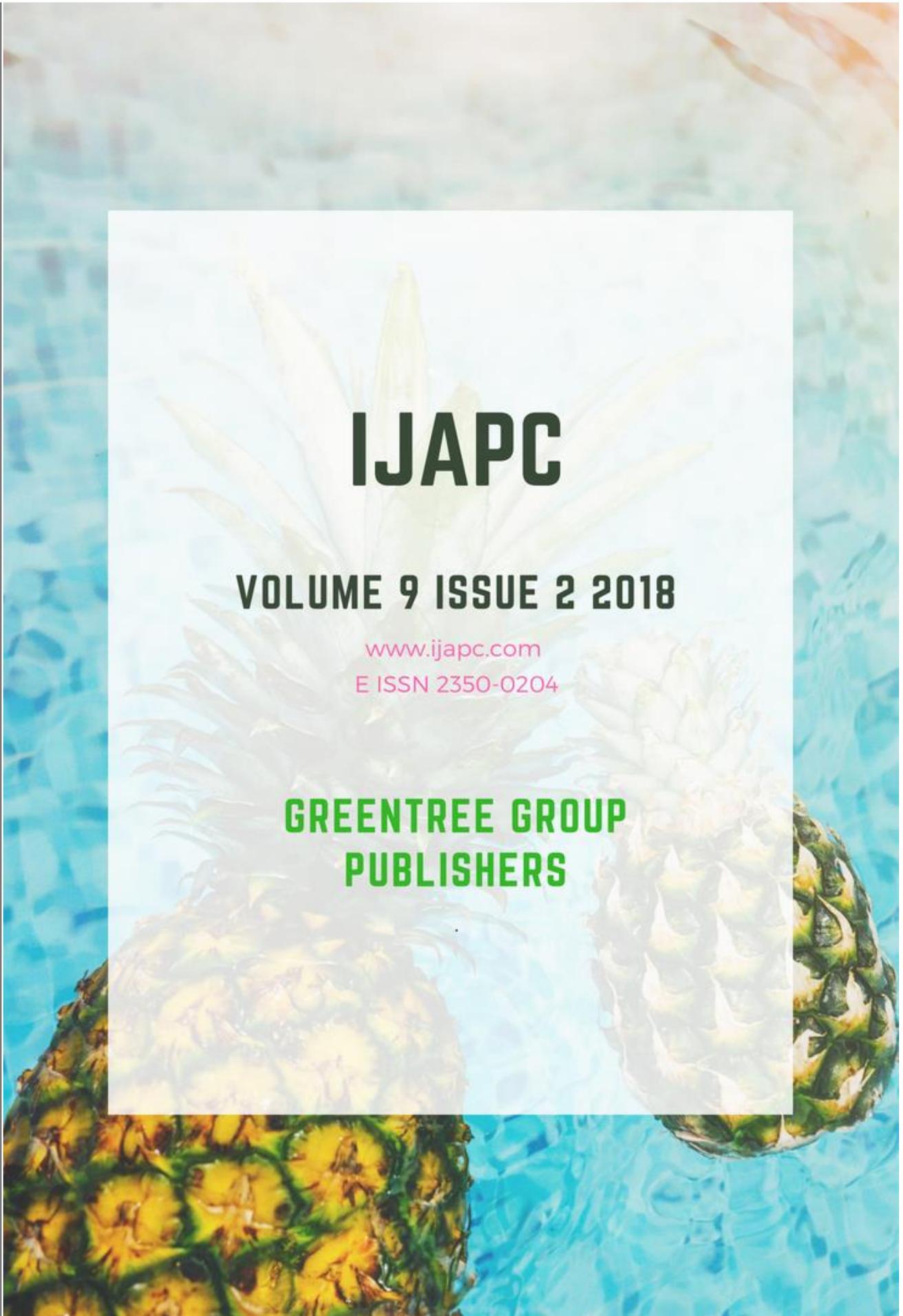
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## Role of Agni in Digestion and Metabolism-A Critical Review

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### ABSTRACT

Ayurved has described *agni* as an important factor for digestion and metabolism in human body. There are three sets of *agnies* help in the process of digestion at their own level. *Aahar* is one sub-supporters needed for daily life. After the digestion of *aahar* by *jatharagni* it turns into *aahar rasa* and *kitta*. *Samana vayu* brings the *aahar rasa* in to *hridaya*. From the heart *vyana vayu* ejects the *aahar ras* forcefully continuously and simultaneously to the whole body. *Bhutagni* helps in transformation and *dhatvagni* for the synthesis and breakdown of tissue. So all these physiological process depends upon the *agni*. It is basically important to our overall health. Disturbance of *agni* lead to formation of *aam* which will cause diseases. In the present article there is some review with the help of references available in the classics that may be helpful to all.

### KEYWORDS

*Aahar, Jatharagni, Dhatvagni, Bhutagni*



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## INTRODUCTION

In *Ayurveda* health is a state where the *dosha*, *agni*, all the body tissues and components, all the physiological process are in balanced state and soul, sense organs and mind are in a state of total wellbeing. So *agni* has an important role for maintenance of health in an healthy individual. *Agni* is the key factor for transformation. It is of 13 types<sup>1</sup>. *Jatharagni* is the principal *agni* and the causative agent for normal lifespan, complexion, strength, health, enthusiasm, growth, complexion, *ojas* (energy/vital essence), luster, other forms of *agni* and even responsible for existence of an individual<sup>2</sup>. *Bhutagni* turns all the *vijatiya panchabhoutika dravyas* consumed to *sajatiya panchabhoutika dravyas*<sup>3</sup>. *Dhatvagni* is in charge for synthesis and breakdown of *dhaatus*<sup>4</sup>.

### TYPES OF AGNI:

*Acharya Chakrapani* has mentioned about 13 types of *Agni*'s. *Jatharagni*–1, *Bhutagni*–5, *Dhatvagni*–7<sup>5</sup>.

According to *Sushruta*, five types of *Agnis* are illustrated, viz. *Pachakagni*, *Ranjakagni*, *Alochakagni*, *Sadhakagni* and *Bhrajakagni*<sup>6</sup>. However, there is an indirect reference of five *Bhutagnis* about the transformation of food stuff<sup>7</sup>.

*Acharya Vagbhata* has described different types of *Agni*'s, viz. – *Audaryagni*-1, *Bhutagnis*<sup>8</sup>-5, *Dhatvagnis*-7, *Dhoshagni* – 3 and *Malagni*<sup>9</sup>-3, *Pitta* -5 .

*Sharangadhara* has described five types of *pitta*. They are *Pachak*, *Bhrajak*, *Ranjak*, *Alochaka* and *Sadhak*<sup>10</sup>. *Bhavamishra* has followed *Acharya Charaka* and *Vagbhata*<sup>11</sup>.

### JATHARAGNI-THE PRINCIPAL AGNI

*Jatharaagni* in its inactive form leads to death of an individual, if it is in active form increases lifespan and diseases free life. If it is in abnormal form it causes various diseases. Therefore *jatharagni* is considered to be the root or chief among all the categories of *agni*<sup>12</sup>. Aggravation and diminution of *jatharagni* results in the aggravation and diminution of other *agni*<sup>13</sup> because they are dependent on *jatharagni*. The appropriate type and amount of fuel in the form of food and drink helps to maintain *jatharagni* in equilibrium condition because life and strength of an individual are dependent upon it<sup>14</sup>.

### BHUTAGNI: THE TRANSFORMER OF MAHABHUTAS

Consumed foods undergo metabolic transformation by the action of *jatharagni*, *bhutagni*, and *dhatvagni*. Initially *jatharagni* kindles the *bhutagni*. So in the

gastrointestinal tract (GIT) both *jatharagni* and *bhutagni* acts simultaneously in the food materials.

After the digestion of food by *jatharagni* in the GIT, *bhutagni's* action still continues and it transforms *vijaatiye panchbhautic* elements of *aahar rasa* in to *sajaatiye panchbhautic* elements which nourishes their own specific *bhautika* elements of the body<sup>15</sup>. This ultimate change in *aahar ras* that occurs at the end of digestion of *jatharagni paka* is performed by *bhutagni*. This process is called *vipaka*<sup>16</sup>.

*Bhutagni* is five in number. They are innate in the food articles<sup>17</sup>. Every *panchbhoutik dravya* has five basic elements and has their respective five *bhoutika agnies*. One *bhoutika agni* is present in each element and are named accordingly. *Bhoumyagni* (*agni* of *prithvi* element), *apyaagni* (*agni* of *apya* element), *taijasaagni* (*agni* of *taijasa* element), *vayavya agni* (*agni* of *vayavya* element), *akasheeya agni* (*agni* of *akasha* element)<sup>18</sup>.

### **BHUTAGNI AND JATHARAGNI: A CONTREVERSY**

Human body consists of 100 trillions of cells<sup>19</sup> and every cell in our body is composed of five *mahabhutas*<sup>20</sup>. Naturally each cell also consists of these five *bhutagnies*. As the *dravya* present in the world that we consume also consist of same

five basic elements with their respective *bhutaagni*<sup>21</sup>.

The body sustaining element which are seven in number undergo metabolic transformation into two different ways viz. *kitta bhag* (transformation of waste product) and *prasada bhag* (transformation of nourishing material). This process occurs with the help of seven *dhatvagni* corresponding to its own *dhatu*<sup>22</sup>. This transformation process supports *Ksheer Dhadhi Nayaya* given by *Chakrapaani*<sup>23</sup>. *Jathargni* acts upon food which leads to the formation of *aaharras*. After that *rasagni* acts upon these *aaharras* and leads to formation of *rasa dhatu* which is *panchabhoutik* in nature<sup>24</sup>. Every material in the universe is *panchabhoutik* in nature and each material is having five individual *bhutagni* inside it. In general *bhutagni* remains present inside the *panchabhoutik dravya* in dormant form. These *bhutagni* inside the *dravya* got activated after getting activation energy from external sources in two ways.

1. In one way the *bhutagni* inside the unripened *dravya* got activated after getting energy from sun light as external sources and transform that unripened *dravya* into ripened *dravya*. On the other hand, if the fruits are remain unused for further purpose then the fruits started to decompose because once the *bhutagni* is activated it transforms

the *panchbhautik dravya* into its individual component.

2. In another way, during cooking, by using external heat in the form of fire, the *bhutagni* inside the *panchbhautik dravya* gets activated that ultimately results in breakdown of composition of *panchbhautik dravya*.

This proves that the activation of *bhutagni* depends upon both external and internal source of *agni*. In cooked *panchbhautik dravya*, *bhutagni* is already in activated form and after ingestion when cooked *panchbhautikdravya* reaches to *grahani*, *jatharagni* comes in action with the help of *saman vayu* and converts it into the most nutritious part called *sara* and waste part called *kitta*<sup>25</sup>. In *lok* when an individual dies, *panchbhautik sharer* starts to decompose and decomposition processes continue until it is converted into basic five elements. This is because when *dehagni* stops functioning, the individual dies but the *bhutagni* inside *panchbhautik sharer* is still in activated form and it remains in active form until *panchbhautik sharer* is decomposed into individual *panchbhautik* component i.e. from *sajaatiye* to *vijaatiye dravya*. Decomposition of *panchbhautik sharer* there after contradictory to the part that *bhutagni* depends upon *jatharagni*.

## ***DHATVAGNI: THE SYNTHESIZER OF DHATUS***

*Dhatvagni* is the most important *agni* in human body. It is responsible for the formation of *dhatuas* well as increase or decrease of *dhatu*. When the *dhatvagni* is in normal stage it leads to the formation of proper *dhatu*. The nutrient portion of *rasa* provides growth and nourishment to subsequent *rakta dhatu*, *rakta* to subsequent *mamsa*, *mamsa* to subsequent *meda dhatu*, *meda* to subsequent *asthi dhatu*, *asthi* to subsequent *majja dhatu* and the nutrient fraction of *majja* provides nourishment to subsequent *sukra dhatu*<sup>26</sup>.

*Tej* portion of *rasa dhatu*, undergoes transformation by the *usmā* of *pitta* and gets converted into *rakta dhatu*. Due to the action of *usma* of *rakta* along with the *vāta*, *ambu* (water) and *tejas*, *rakta* attains compactness and get transformed into *mamsadhatu* after being acted upon by *mamsadhatvagni*<sup>27</sup>. These *vayu*, *ambu* and *teja* are the *abhyantara mahabhuta* which are formed by the action of *panchabhutagni*. So the *bhutagnipaka* is important among the *pakas* because it provides raw materials in the form of *vayu*, *ambu* and *tejas* etc for *dhatu* formation. Malfunction of *bhutagni* causes malformation of *mahabhuta* (substrate) and subsequent malformation of *dhatu*. *Dhatu*

is an important basic component of *shareer*. *Shareer* develops because of nourishment of seven *dhatu* which are also a combination of *panchamahabhutas*.

Health of living beings depends on wholesome food and disease is caused by unwholesome food. Intake of delicious and wholesome food associated with smell, taste, color, touch and sound nourishes the olfactory, gustatory, optic, tactile and auditory sense organs in the body, respectively. These functions are happened with the help of *bhutagni*<sup>28</sup>.

Generally all diseases are produced by *mandagni* (weak digestive activity) especially so the *udara* (enlargement of the abdomen)<sup>29</sup>. *Aahar rasa* formed because of *mandaagni* is not fit for subsequent *dhatu* formation. The first *dhatu*, *rasa* which has not been transformed properly due to *mandagni* (of digestive fire) and which is vitiated and remains in the *amasaya* is known *asaam*<sup>30</sup>. These free radicals are present in body due to disturbances in *bhutagni* as well as *jatharagni* as *bhutagni* principally depends upon *jatharagni*.

### **DHATU POSHANA NYAYA AND AGNI:**

Heart ejects the essence part of *aahar rasa* along with *rasa-rakta* simultaneously, continuously and forcefully so that it is

circulated all over the body and reaches to the level of *dhatu* as per *kedarikulya nyaya*. According to the *khalekapota nyaya* the nourishment of *dhatu* takes place by selective absorption. The nutrient portion travels through different channels. Different *dhatu*s get nourished by its specific nutrient portion at different stages. Nutrient portion leaks from the capillaries during circulation and reaches to the level of tissue fluid. Required nutrients are selectively absorbed by active absorption. This requires expenditure of energy.

Similarly *rasa* flow to each *dhatu* and uptake of *poshya dhatu* is regulated depends on the metabolic needs of the particular *dhatu*. For example in the formation of *rakta dhatu*, iron, vitamin B<sub>12</sub> and folic are required. This theory can also explain the transport of different particle across the cell membrane with the expenditure of energy. This is because the pigeons in the above example have to spend energy to procure the grain.

The seven type of *dhatvagni* specific to their *dhatu*s are *rasagni*, *raktagni*, *mamsagni*, *medagni*, *asthagni*, *majjagni*, and *sukragni*. *Dhatvagni* is essential factor for *dhatu* formation, maintenance and growth of *dhatu*s. Within physiological limit if *kayagni* is strong, *dhatvagni* become strong. If *dhatvagni* is strong it will utilize the substrate of *aahar rasa* and if not

satisfied begins to destroy the *dhatu*s itself which leads to *dhatukshyaya*. Hence both *vridhhi* and *kshyaya* of *dhatu*s are mainly due to weak and powerful *dhatvagni*, respectively<sup>31</sup>.

The amount of food that a person ingests is determined principally by intrinsic desire for food called hunger. The type of food that a person preferentially seeks is determined by appetite<sup>32</sup>. So one should take proper quantity of food because the quantity of food is determined by *agni bala* (power of digestion and metabolism)<sup>33</sup>. The *agni bala* also varies according to season as well as age of an individual. Thus it depends upon number of factors. The amount of food should be taken in proper quantity so that it will get digested as well as metabolized in proper way.

Little amount of food intake or starvation for long time causes weight loss. In this condition *jatharagni* is not functioning well because of little or no intake of food. So *mandagni* leads to *manda dhatvagni* which should increase the *dhatu*s. But here gradual loss of *dhatu* begins which is a contradiction.

*Khalekapotanyaya* explains the transport of different particles across the cell membrane which requires expenditure of energy. Likewise with the help of specific enzyme the transformation in the metabolic pathway can be understood by *ksiradadhi*

*nyaya*. Food is hydrolyzed the alimentary tract into such a simple that it can be absorbed into blood. Then *saman vayu* brings the *aahar rasa* into heart. After that it is distributed to all other parts of the body by the help of *vyana vayu*.

### **AAHARA AND VIHAR: THE CAUSATIVE FACTOR FOR DISTURBANCE OF AGNI**

Excessive fasting or over eating causes *mandagni*, as like fire in environment is extinguished if there is no fuel supply or if excessive fuel covers the *agni*<sup>34</sup>. One should take the right quantity of food always since it is the quantity which helps to maintain proper digestive power<sup>35</sup> and also provides strength, complexion, happiness and longevity to the person without disturbing the normalcy<sup>36</sup>.

Meals even if suitable and taken in proper measure does not get digested properly if the person suffers from anxiety, sadness, fear, anger and has undergone uncomfortable sleep and has remain awake for a long period<sup>37</sup>. Psychological attitudes like envy, fear, anger etc are the causative factors of indigestion. So strength of *agni* depends upon the proper diet and mental factors.

### **AGNI AND METABOLIC DISORDER:**

All the transformations in the body are catalyzed by *Agni*, if *agni* is impaired, the proper transformation of food into *Dhatu*s and *Malas* are also impaired and this will lead to accumulation of waste products in the body.

Lack of exercise, sleep during daytime, excessive intake of fat & alcohol rich diet leads to vitiation of *medavaha srotas*<sup>38</sup>. Following such kind of excessive life style and dietary habit leads to accumulation of *medodhatu* in *medovaahi srotas* which causes obstruction (*sang*) in *medovaahi srotas*. Obstructed *medovaha srotas* causes more synthesis and accumulation of *medo dhatu* in *medovaha srotas* which prevents further synthesis of subsequent *dhatu*s of *asthi*, *majja* and *sukra dhatu*<sup>39</sup>.

As per the principles of *pratisrotomargnyaayena* excess of *meda dhatu* in the *medovaha srotas* leads to excess formation of previous *mamsa dhatu*, likewise excess of *mamsa dhatu* leads to excess formation of previous *rakta dhatu*, excess of *rakta dhatu* leads to excess formation of *rasa dhatu*<sup>40</sup>.

Further as per the principles of *Kshir Dadhi Nyayya*<sup>41</sup> excess of *rasa dhatu* leads to excess synthesis of consequent *rakta dhatu*, excess of *rakta dhatu* into *mamsa dhatu* and excess of *mamsa dhatu* into *medo dhatu* and further the principles of *pratisrotomargnyaayena* takes place and

ultimately excess of abnormal *medo dhatu* is formed.

## DISCUSSION:

Within physiological limits, if *kayagni* is strong then *dhatvagni* becomes strong. If *dhatvagni* is strong then it leads to *dhatukshyaya*. Similarly if *kayagni* is weak then *dhatvagni* becomes weak and leads to *dhatu vriddhi*. But beyond physiological limit in case of low intake or starvation for long time is an exception to the concept described in *Samhita*. If *agni* is in equilibrium state it maintains normal healthy life. Proper quantity of *aahar* keeps the *agni* in equilibrium or within physiological limit. If *aahar* is not in proper quantity, the equilibrium of *agni* is not maintained. Improper quantity of food can be classified in two categories.

In first category when the quantity of food intake is less for a long time as in case of starvation causes *mandagni* and ultimately *dhaatu kshyaya* which is an exception.

In second category when quantity of food is more, as in case of overeating, it also causes *mandagni* which further decreases the strength of *dhatvagni* and the ultimate result is *dhaatu vriddhi*. In case of *tikshnagni* equilibrium of *dhaatu* is maintained by the use of *guru aahar* at short intervals. If *aahar* is not given it causes *dhaatu kshyaya*.

Intake of unwholesome food alone is not only the causative factor for a disease. Apart from unwholesome food, there are many other etiological factors that lead to a disease, such as changes in season, intellectual errors, excessive, wrong and overutilization of senses of sound, touch, vision, taste and smell. These etiological factors can cause diseases in an individual despite wholesome intake of diet.

Among all the three *agni*, *bhutagni* has an important role in the digestion and metabolism. *Bhutagni* provides substrates and helps in the formation of *dhatu*. *Dhatu* is an important basic component of *shareer*. *Shareer* develops because of nourishment of seven *dhatu* which are also a combination of *panchamahabhutas*. *Bhutagni paka* provides raw materials in the form of *vayu*, *ambu* and *tejas* etc for *dhatu* formation.

## CONCLUSION:

It may be concluded that *Agni* is responsible for digestion and metabolism in human body. The healthy state of *agni* depends upon nature and quantity of food intake. A wholesome diet is essential for good health and prevention of disease. Malfunction of *agni* occurs due to intake of unwholesome and improper quantity of food intake and other factors which leads to formation of *aam*. It causes *sroto dusti* and leads to

several diseases. So wholesome combination and appropriate quantity of food should be taken. Yoga and meditation should be done in mental disturbances.

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