

CONCEPT OF NUTRITIONAL DYNAMICS OF TISSUE (DHATUPOSHANA)- AN AYURVEDIC APPROACH

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ABSTRACT

In Every dynamic system whether it is a machine or living cell, it loses mass when it is left to itself. Against this persistent destructive tug, the living cell must pit itself-repair and replace. The structural metabolism based on nutrition, and energy metabolism makes such gains possible. Fuel sources are required from which structural supplies may be procured. The concepts of *Saptadhatus* of ayurveda refer to the physiology of basic nutritional and structural factors of the body. They are being constantly formed, destroyed and reformed with appropriate material derived from *Poshakadravya* (nutrient substances) from the time of conception to death. All ancient texts have postulated the view that *Saptadhatus* are produced in a kind of progressive transformation, beginning with the *Rasadhatu* and ending with *Sukradhatu*, the previous *dhatu* being transformed in to the next higher. The implications of this theory have been sought to be explained in terms of three different hypotheses. These theories regarding the nourishment of the *Dhatus* are termed as “*DhatuPoshanaNyaya*”. The *KsheeradadhiNyaya* emphasizes on the *Dhatavagnipakajanya prasadamsha* (Law of Transformation) while the *KedariKulyaNyaya* stresses on the *Rasasamvahana* (microcirculation and tissue perfusion) and the *KhaleKapota* on the *Srotasas /Channels* (selective uptake of nutrient by respective cells and tissues).

Keywords: Nutrition, *Poshakadravya*, *DhatuPoshanaNyaya*

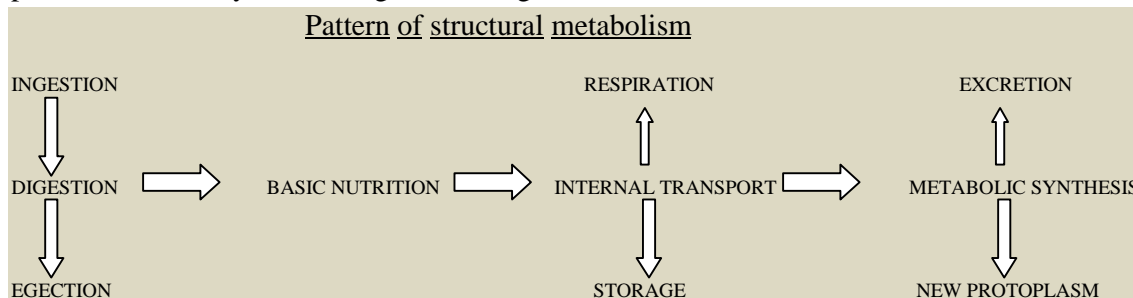
INTRODUCTION

The body, according to *Aurveda* is the result or an outcome of nutrition. Diseases, on the other hand, are the result of mal and or impaired nutrition. The manner in which the nutrition ingested is digested: the way in which its various components are metabolized in to appropriate *dhatu* or tissue elements, and how some of its constituents are broken down for being utilized for the production of energy required for vital activities. The concepts of *Saptadhatus* of ayurveda refer to the physiology of basic nutritional and structural factors of the body. They are being con-

stantly formed, destroyed and reformed with appropriate material derived from *Poshakadravyas* (nutrient substances) from the time of conception to death. All ancient *Samhitagranthas* have postulated the view that *saptadhatus* are produced in a kind of progressive evolutive metamorphosis, beginning with the *Rasadhatu* and ending with *Sukradhatu* the previous *dhatu* being transformed in to the next higher³. Ancient scientists described the evaluative metamorphosis of *dhatus* as occurring in the course of *dhatwagnipaka*, yielding *dhatu*s and *kittas*, in its *prasada* and *kit-*

tapakas respectively. These dhatus constantly undergoing metamorphosis and transported through *dhatuvahasrotansi* (Channel that conduct *dhatus*).⁴ *Dhatus* are classified in two categories 1) *Sthayi* or *Posya* 2) *Asthayior Poshaka*. The *Sthayi* or *Posyadhātu* support the body, by providing it with basic tissue, the *Poshaka (asthayi) dhatus* are seen to support the former by nourishing, sustaining

and maintaining them.⁵ The term *dhatu* pertain to nutrients also in transit and not only to tissue that already exist such as bones, muscles, blood etc. The implications of this theory have been sought to be explained in terms of three different hypotheses. These theories regarding the nourishment of the *Dhatus* are termed as “*DhatuPoshanaNyaya*”.



NOURISHMENT OF THE DHATUS AS PER THE DHATUPOSHANANYAYAS

The examination of the subject with the proper evidences and logic is the *Nyaya*. The *Siddhanta* is the one which is accepted by all after multiple experimentation and observation and is always the truth but the *Nyaya* is ones view and is the way a person sees a process happening which varies from person to person. In the case of the “*DhatuPoshana*” also a number of theories have been proposed. Thus, all these theories proposed by the *Acharyas* are to be seen as a view based on the observation and logic. Thus, these theories regarding the nourishment of the *Dhatus* are termed as “*DhatuPoshanaNyaya*”.

1) KSHEERADADHINYAYA (MAXIM OF THE MILK & CURD)

Also known as the Law of Transformation, or the *Sarvatmana Parinama Paksha*, the *Ksheeradadhi Nyaya* has been the first of the theories placed forward towards the understanding of the *Dhatu Poshana*. According to this *Nyaya*, the one *Dhatu* transforms into the other successive *Dhatu* just as the milk transforms into the curd so is the term “*KsheeradadhiNyaya*”. As per this *Nyaya*,

one *Dhatu* becomes the nutrient for the other. This implies the transformation of the *Rasa* into *Rakta*, *Rakta* into *Mamsa*, and *Mamsa* into *Meda* and so on. Thus, the previous *Dhatu* acts as a substratum for the successive one. The time taken for transformation of *Rasa* into the *Shukra* as per this *Nyaya* is explained in various ways by the seers of yore. As per the strength of the *Dhatavagni* and the *Bhootagni*, the *RasaDhatu* undergoes transformation into the successive *Dhatus*. Some *Acharyas* say that the *Rasa* transforms into the *Shukra* in six days. *Parashara* says that the *AharaRasa* transform into the *RasaDhatu* in 24 hours, *RaktaDhatu* is formed on the third day, *Mamsa* forms on the fourth day, *Meda* on the fifth, *Asthi* on the sixth, *Majja* on the seventh and the *Shukra* is formed in the eight days. *Sushruta* is of the view that the *Rasa* stays in each *Dhatu* for a period of 3015 *Kalaas*, approx. 5 days. Thus, in about a month the *Shukra* and the *Artava* are formed in the Male and Female respectively. Thus, from the above difference of opinions it is hard to pinpoint the time required for the transformation of the *Dhatus*. This means that the *DhatuPoshana* process continues continuously without any pause. Explain-

ing this with an example of the person drawing out water from a well using a wheel; it is found that the strength of the person turning the wheel is responsible for speed of drawing the water out of the well. The more the strength of the person the more is the speed of drawing the water. Similarly, the strength of the factors like Agni decides the time for the formation of the *Dhatu*s.

Raising the doubts in the authenticity of the *KsheeradadhiNyaya*, *AcharyaChakrapani* contends that if this *Nyaya* is accepted then, if a person performs fast for 3-4 days, the *rasadhātu* of this individual should be depleted. Similarly a fast of a month shall make the body devoid of all the six *Dhatu*s and only the *Shukra* will remain. Clarifying these doubts *Vagbhata* and *Dalhana* say that after the digestion of food the food gets divided into two parts viz. the *Sara* (potent part) and the *Kitta* (Excretory part). The *Sara* is acted upon by the *Dhatavagni* that again divides this part into two parts, one *Sthoola* and other *Sookshma*. The *Sthoola* part nourishes the *Dhatu* while the *Sookshma* part nourishes the *Upadhātu* and the successive *Dhatu*. The *Sookshma* part of the preceding *Dhatu* is acted upon by the *Agni* of the successive *Dhatu* which produces three parts viz. *Sthoola*, which nourishes the self (*Dhatu*); *Sookshma*, which nourishes the *Upadhātu* and consecutive *Dhatu*; *Mala* which nourishes the excretory portion.⁶

2) *KEDARIKULYANYAYA* (MAXIM OF THE FIELD AND THE CANAL) -

This is also known as the Law of Transmission or the *Kramaparinamapaksha*.

The *Kedari* means the field while the *Kulya* means the canal. This *Nyaya* likens the nourishment of the *Dhatu*s with the irrigation of the different fields with the canal. The water irrigates the nearby field first and then it irrigates the distant ones. The *Rasadhātu* nourishes the *Rakta* first.

When the *Rasadhātu* contacts with the site of

the *Raktadhātu*, the former takes the form of *Rakta* i.e. the *Rasa* acquires the odour, colour of the *Rakta* and nourishes it by the homologous fraction. Similarly, other *Dhatu*s are nourished. The speciality of this *Nyaya* is that the *Rasa* travels through a single path and nourishes all the *Dhatu*s. *Harita* has also accepted this theory. According to him the *Rasa Dhātu* undergoes change of the colour to white; grey and green etc. throughout the day before it gets converted to *Rakta*. This *Nyaya* is most widely accepted among the *DhatuPoshana* theories. This *Nyaya* explains all the aspects of the *Dhatu Poshana* processes. The *Rasa* in the state of excess will not accept the nutrients just as the field which is completely saturated with water refuses to accept more, thus making more water available for the subsequent fields. Similarly, the increase in one *Dhatu* may lead to the increase of the nearby *Dhatu* as the channels of this *Dhatu*s are very near. The *Dhatu* in excess will refuse to accept the *Panchabhautic* raw material in the form of *Rasa* and makes way for the nourishment of the nearby *Dhatu*s. From various references it becomes clear that there is physiological relation between the various *Dhatu*s and their respective *Srotasas* / Channels and they are influenced by one another as the various canals for nourishment of the field are interlinked. Similarly, decrease in one *Dhatu* will lead to the decrease in the other as the diminished one will consume more nutrients just as the field that is dry consumes more water leading to the scarcity of water in the other fields. In the case of *Rajayakshma*, the interrelation between the various *Dhatu*s is clearly visible in the concept of *PratilomaKshaya*.

The *Pratilomakshaya* means the *kshaya* of the later *Dhatu* shall lead to the *kshaya* of the previous one. Thus, it is to be accepted that the increase in one will also lead to the increase in the other proving the above principle. Another concept to prove this theory is by applying the *UpasnehaNyaya*. This *UpasnehaNyaya* has been explained

in the context of foetal development⁶. Just as the trees on the banks of a river get nourished with the water, the increased *Dhatu* also nourishes its nearby *Dhatu*s. The word *Upasneha* indicates the mode of the travel of the nutrients like the Osmosis.⁷

3) KHALEKAPOTA NYAYA / MAXIM OF THE BARN & THE BIRD -

This is also known as the Law of Selectivity. According to this *Nyaya*, the nourishment of the *Dhatu*s takes place by selection. The nourishing fluid, *AnnaRasa* travels to the different *Dhatu*s through different channels. In the beginning, the nearby *Dhatu* draws its nutrient fraction from the nourishing fluid and the distant one gets nourished later. This theory is based on the analogy of the pigeons carrying the grains from a field and moving in different directions to reach their destination, nest. The nest which is near will get the grain first while the nest farther will receive the grain later. This theory believes that each *Dhatu* has its specific nutrient, *Poshakamsha* (Nourishing part). This theory is accepted in the case of the origin of the disease also as the *Doshas* travel in the different *Srotasas* and the place where there is vitiation, *Kha-Vaigunya*, produce the diseases.⁸

EK KALA DHATU POSHANAN-YAYA (MAXIM OF THE SIMULTANEOUS NOURISHMENT)

This theory has been propounded by the commentator, *Arundutta*, as he doesn't consider any of the theories fully applicable in explaining the *DhatuPoshana*. *Arundutta* clarifies that the *AharaRasa* nourishes all the *Dhatu*s of the body simultaneously by the particular fraction of that *Dhatu* by entering the respective *Srotasa* of that *Dhatu*. *AcharyaCharaka* has also narrated this in reference to the *VyanaVayu* which is said to carry the *RasaDhatu* throughout the body simultaneously.⁹

DISCUSSION

The process of birth and death is going on all the time- the dead cell being replaced by the new ones of the species. It seems to us that our body is stable and intact; in reality it is dying and being reborn all the time. The materials with which new cells are manufactured are derived only from one source, and that source is food. By the same token, the material for the formation of the functional factors, such as *vata* pitta and *kapha*, as well as the sevenfold structural elements viz. the *saptadhatus*, are also derived from the food ingested. These *dhatu*s are formed, destroyed and reformed, all the time, in a living man, maintaining a state of dynamic metabolic equilibrium. *Dhatu*s are of two kind's viz. *sthayi* or *poshya* and *asthayi* or *poshaka*. The *posyasthayidhatu*s support the body by providing it with basic tissue, the *poshaka* or *asathayidhatu*s are seen to support the former by nourishing, sustaining and maintaining them.

KedariKulyaNyaya or microcirculation and tissue perfusion: This *nyaya* states that the living body is provided with innumerable micro vascular channels which carry nourishment to the respective sites in *Dhatu*s (tissues). The cells and tissues are literally perfused with nutrient plasma but mere tissue perfusion is not enough to complete the process of nourishment. This needs the complementary play of the subsequent two *nyayas*. **KhaleKapot Nyaya** refers to the selective uptake of nutrients by respective cells and tissues in the same way as the birds of different species pickup selective grains and cereals from common harvesting ground because the *KedariKulyaNyaya* provides a total pool of nutrients at the site of all tissues but the different tissues require different specific nutrients and hence there is a need of active selective uptake. As an example the bone tissue will only take the amino acids and minerals like Calcium Phosphorus, while the blood tissue will uptake specifically the nutrients like Iron etc. which is necessary for formation of blood. *Vagbhata* states that "As the flame of the forest fire tends to increase or decrease

according to the quantity of fuel, so also is the case with *dhatuparinama*. Substances are either similar or distinct, which cause an increase or decrease as the case may be, of the tissues due to the properties potentially inherited by them, as in the case of a seed; homologous properties of substances cause sufficient and rapid increase of identical or homologous properties in the tissues". *KshiraDadhiNyaya* refers to the final transformation and assimilation of the up-taken nutrients into the tissue system and life process. This essentially is comparable with the conversion of milk into yogurt, hence the term *Kshira* "milk" *Dadhi* "yogurt" *Nyaya*. It is where the preceding tissues get transformed into the succeeding tissue. The first tissue, *rasadhātu*, is "cooked" by the respective *agnis* and becomes *rakta*, similarly the *raktadhātu* (blood tissue) changed as *mamsadhātu* (muscle tissue) and *mamsadhātu* changes into *medadhātu* (fat tissue).

CONCLUSION

The above description makes one point clear that *Ayurveda* has accepted the importance of the *Rasa* in nourishment of all the *Dhatus*. All the *Nyaya*s is correct in their approach and there is not much of a difference among them. The entire three *Nyayas* act as a unit and it is not possible to explain *Dhatu - Poshana* with the exclusion of any of them. Thus, all the three act in full harmony to show the complete process the *Dhatu-Poshana*. The *Ahararasa* first nourishes the *Rasadhatu* by the *Ksheeradadhi Nyaya*. The *Rasadhatu* accepts the nourishment from the *Rasa* and the remaining portion by the application of the *Kedari Kulya Nyaya* nourishes the *Rakta* by behaving like the *Rakta*. The remaining portion moves ahead in the *Mamsavaha Srotasa* to nourish the *Mamsadhātu*. Thus, all the three act together to nourish the *Dhatus*. In this way the *Dhatu*s nourish each other and so the increase in one leads to the increase of the other and vice versa proving the principle "*Poorvahpoorvoati vriddh atvat- vardhayeddhparam*". The *Ksheeradadhi Nyaya*

emphasizes on the *Dhatavagnipakajanya prasadamsha* while the *KedariKulyaNyaya* stresses on the *Rasa samvahana* and the *KhaleKapota* on the *Srotasas /Channels*.

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