

PHYSIOLOGICAL ASPECT OF UPDHATU AND FORMATION OF AARTAVA FROM
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ABSTRACT

Ayurved is a healing science based on the studies and keen observations. Ayurved gives priority to maintain the healthy state of a normal human being and treat the disease of patient. Success of any science depends on its fundamental principles. Human being has emerged as a very specialized species in the process of evolution. For the existence of body, two elementary factors are there, one that form structural configuration and second which control physiological aspects. Ayurveda has explained the physiological functions of human body under three elements viz. Dosha, Dhātu and Mala. Updhatus are important physiological units and are derived from Dhatus and resemble Dhatus in terms of structure, function and nature. Updhatus are sub tissues or secondary tissues in the body which serve as important components and have certain fixed functions to render. Dhatus are closely associated with the Updhatus. Updhatus are derived from the first four Dhatus. Updhatus are finest product of Dhātu metabolism. Dhatavagni plays major role in metabolism of Dhatus and Updhatus. Updhātu is subsidiary tissue arises from Dhatus. They are important physiological units and engaged to design the structural composition of the body. Dhātu form the basic structure of the body, they are not able to execute the functions of body without the support of Upadhatus. Upadhātu act as a bridge between these fundamental entities. Upadhatus are also involved in emergence of diseases and the knowledge is necessary to understand the pathological conditions. Stanya (breast milk) and aartava (menstrual flow) being the Updhatus of Rasa Dhātu; their quality, quantity excellence depends on metabolic and functional status of Rasa Dhātu.

INTRODUCTION

Roots of tree are very important for maintenance, stability and growth of a tree, similarly *Dosha*, *Dhātu* and *Mala* are very important for maintaining human body. There are seven *Dhātu* which is derived from *Ahara Rasa* that is *Rasa*, *Rakta*, *Mamsa*, *Meda*, *Asthi*, *Majja* and *Shukra*. *Dhatus* and organs get developed in the embryological stage (*Garbha*) and after birth these *Dhatus* gradually grow. For growth and development *Dhātu* needs nourishment. These *Dhatus* are nourished by *Ahara-Rasa*. Formation of New *Dhātu Ahara* Repair Damaged *Dhātu* Every elements in this universe is composed of *Panchmahabhuta* i.e., *Akash*, *Vaayu*, *Agni*, *Jala*, *Prithvi*. *Ahara* is the main factor for formation of *Rasa*. *Ahara* is also made of *Panchmahabhuta*, having six tastes (*Madhur*, *Amla*, *Lavana*, *Katu*, *Tikta* and *Kashaya*) possess many properties when indigested undergoes digestion. After being digested properly, *Ahara* with the help of *Kosthagni* present in stomach (Gastric juice-Hydrochloric acid) and small intestine arise its vital essence known as *Ahara Rasa*. They are nourished from *Sara* portion produced in digestion of nutrient fluid in *Dhātuvahasrotas*. It means they are produced directly

from *Ahararasa*. It is needed for *Ahararasa* to undergo more digestion for giving rise to *Dhātu* as well as *Updhātu*. All the seven *Dhatus* of the body contains their own fire (*Agni*) in order to metabolize the nutrients (micro as well as macro) supplied through *Srotas* (channels of circulation). Substances that are present in the body which only perform *Dharana Karma* is *Updhātu*. Meaning of Up is Sub, sub ordinate, subsidiary, secondary and *Dhātu* means tissue. *Updhātu* is subsidiary tissue which provides base to the body but they do not nurture it like *Dhātu*. *Updhātu* helps to sustain body. The main difference between *Dhātu* and *Updhātu* is that any changes or vitiation in *Dhātu* results in the effect in *Uttar Dhātu* but this can't happen in case of *Updhātu*. Each of seven *Dhātu* nourishes and supports *Updhātu* which is subsidiary tissue or secondary tissue product and produce *Malas* (waste products). The *Updhātu* neither nourish each other nor any other tissue for the matter. In *Ayurveda* classics formation of *Aartava* (Menstrual blood) is from *Rasa Dhātu* and the *Rakta* named *Raja* is formed which get accumulated in uterus and comes out for three days every month. All *Anulomana* activities of reproductive system are under

the control of *ApanaVata* including monthly cyclic flow of *Aartava*. Duration of the bleeding time (*Raja Strava Kala*) is three, five and seven days by different *Acharyas*.

Vyutpatti

The word '*Upadhatu*' consists of two parts with Prefix "*Upa*" and the word "*Dhatu*". The literary meaning of "*Upa*" is towards, near to, by the side of, resemblance, nearness, with the idea of subordination and inferiority. The word '*Dhatu*' is derived from the root "*Dha*" which means to support and nourish. Everything existing is supported by this or because they bear and support, they are termed as *Dhatu*. Which supports the growth of the body is termed as *Dhatu*. *Dhatu*s are stable constituents, the basic elements of the body, which make the body exist.

Nirukti

Shows close resemblance towards *Dhatu*. Those, which are derivatives of *Dhatu*s, produced at complementary, subsidiary level, are known as *Upadhatu*s.

Definition

Elements of the body which are derived from *Dhatu*s and which are not further subjected to any transformation are called *Upadhatu*s.

MATERIAL AND METHODS

Formation of Upadhatu

Dhatu metabolism is a nourished pool of all the body constituents. Through this pool all elements including *upadhatu*s get their nourishment. *Upadhatu*s are sustained being fed by their nourishing factor. Food after digestion takes two forms viz. the *Prasada* part (essence)

and the *Kitta* part. Depending upon their nourishment from *Prasadaja* or the *Kitta*, the tissue elements of the body are described of two types, the pure one "*Prasadakhya*" and waste product "*Malakya*". From *Prasadaja* portion all the *Dhatu*s are formed in progressive order. *Upadhatu* are also nourished from this *Prasadaja* part. *Ahara Rasa* when goes to the abode of one *Dhatu* after the action of that particular *Srotasagni* it is transformed into two parts *Prasadaja* and *Kitta*. *Prasadaja* portion is further divided into two parts. The main portion of it provides nourishment to that *Dhatu* and the subtle portion (*Suksma Bhaga*) is meant to provide nourishment to two elements, by its further division. The major portion of it goes to the site of next *Dhatu* and the subtle of it provides nourishment to the *Upadhatu*. Third waste portion nourishes the Mala of the respective *Dhatu*. In this way from the *Prasadaja* part of *Ahara Rasa Upadhatu*s derive their nourishment in progressive order. When *Ahara Rasa* comes to the abodes of *Rasa Dhatu*, by the action of *Rasadhatvagni* it get transformed into two parts, the *Prasadaja* portion and the Mala portion. The *Prasadaja* part again gets divided into two parts. *Sthula Bhaga* and *Suksma Bhaga*. *Sthula* portion of it supplies nourishment to the *Rasa Dhatu* and *Suksma* portion of it again divided into parts. The major portion of it goes to the abodes of *Rakta Dhatu* and subtle part provides nourishment to *Stanya* and *Raja*. In the same manner the subsequent *Upadhatu*s are derived from their respective *Dhatu*s. The process of *Dhatu* metabolism goes on continuously like the passage of time (*Kalavat Anavasthitatva*). If all the *Dhatvagnis*, *Vayu* and *Srotases* are unimpeded they play a pivot role in continuation of *Dhatu* metabolism. These components are closely related with *Upadhatu*s too.

No. of Upadhatu According to Different Acharyas.

Acharyas	Name of Upadhatu	NO.
Sharangdhar, Bhavmishra, Trimalla Bhatt	Stanya, Raja, Vasa, Sweda, Danta, Keshha, Oja	07
Vridhha Vagbhatt, Dalhana.	Stanya, Raja, Kandara, Sira, Vasa, Twak, Snayu, Sandhi.	08
Charaka Samhita, Gayadass, Chakrapani	Stanya, Raja, Kandar, Sira, Vasa, Twak, Snayu.	07
Bhoj	Stanya, Raja, Vasa, Sweda, Danta, Keshha, Oja. Stanya, Raja, Sira, Twak, Snayu	05

Upadhatu According to Different Acharyas

Acharyas	Stanya	Raja	Kandara	Sira	Vasa	Twak	Snayu	Sandhi	Sweda	Danta	Kesa	Oja	Total
Charaka	+	+	+	+	+	+	+	+	-	-	-	-	8
Gayadasa	+	+	+	+	+	+	+	+	-	-	-	-	8
Chakrapani	+	+	+	+	+	+	+	+	-	-	-	-	8
Bhoja	+	+	-	+	-	+	+	-	-	-	-	-	5
Ashtanga Sangraha-kara	+	+	+	+	+	+	+	+	-	-	-	-	8
Dalhana	+	+	+	+	+	+	+	+	-	-	-	-	8
Sarngadhara	+	+	-	-	+	-	-	-	+	+	+	+	7
Bhavamisra	+	+	-	-	+	-	-	-	+	+	+	+	7

Stanyam

Stanya refers to the breast milk. Hence it is the *upadhatu* present only in females and related to reproduction. It derives its nourishment from *Rasa dhatu*. Performs the function of providing nourishment to the infant.

Rajas

Rajas or *Raja* means the menstrual blood. This one is also the female specific *upadhatu* and appears in a particular reproductive age group in females. Performs the important function of providing seat and nourishment for embryo in initial period.

Kandara

Commentator *Charkrapani* has defined *Kandara* as the '*Sthula Snayu*' or '*Sthula Sira*'. These are *upadhatu* of *Rakta dhatu* and assist in the function of locomotion.

Sira

Upadhatus of *Rakta dhatu*. *Sira* refers to the vascular structures in the body that perform the function of transport, circulation, transmission of bodily elements. The root term '*Sru*' from which the word '*Sira*' is derived indicates flow.

Vasa

Mansa dhatu's upadhatu is '*Vasa*'. The term '*Vasa*' is coined on the basis of its function of covering the body

or wrapping the body, abdomen etc. It refers to the fat that fills up various muscle spaces, covers vital organs and supports or protects other structures like vessels and organs.

Twak

Twak is the *Sanskrit* term for Skin. It is the outermost covering layer of the body. It protects the entire structure of *Shariram* and thus plays important role as the barrier between external and internal environment. It is the *upadhatu* of *Mansa dhatu*. It is believed to be composed of 6 layers.

Snayu

Upadhatu of *Meda dhatu*. These are the body constituents which bind any 2 body structures at their joint. Such joints are called as *Sandhi* in *Ayurveda*. Thus, they perform the function of holding the entire structure together. Classics have described Nine hundred *Snayus*.

Sandhi

Sandhi refers to joint between any 2 or more structures in the body. Commentator *Dalhana* of *Sushruta Samhita* has described *Sandhis* as *Upadhatus* of *Meda dhatu*.

Updhatus and their Disease

Upadhatu	Disease
<i>Rajah, Stanya</i>	Concern with female physiology
<i>Kandara, Sira, Snayu, Sandhi</i>	Distinctly related with <i>vata</i> & involved in chronic stages of other diseases.
<i>Sira</i>	Conveyance of <i>doshas</i> to the place of " <i>kha- vaigunya</i> " thus involved in pathogenesis of many diseases.
<i>Vasa</i>	Distinctly involved in <i>prameha</i> , one of the <i>dusya</i> of <i>prameha</i> .
<i>Twak</i>	Many underlying pathological conditions manifest on skin

Dosha and updhatu

Dosha	Updhatu
<i>Vata</i>	<i>Kandara, Sira, Snayu, Sandhi, Twak</i>
<i>Pitta</i>	<i>Rajah, Twak</i>
<i>Kapha</i>	<i>Stanya, Vasa</i>

Updhatu and Rogmargas

Updhatu	Rogmargas
<i>Rajah, stanya</i>	<i>Bahya</i>
<i>Kandara, Sira, Snayu, Sandhi</i>	<i>Madhyam</i>
<i>Vasa, Twak</i>	<i>Bahya</i>

Updhatu and dhatu

Updhatu	Dhatu
Dhatvantara Posakatva- Dhatu nourishes successive Dhatu	Dhatvantara Aposakatva- Dhatu do not nourish successive Dhatu or Upadhatu
Gativivarjita- This property is not found in Dhatu	Gativivarjita- Upadhatu possesses Gativivarjitva in relation with Dhatu
Dhatu Sneha Parampara- Dhatu nourishes successive as well as former	Dhatu Sneha Parampara- Such type of inter

Dhatu. They are connected to each other through nourishing pool	relation is not present in Upadhatu
Sarira Posakatva- It is present in Dhatu	Sarira Posakatva- It is present in Upadhatu also
Sarira Dharanatva- Dhatu bear the body elements	Sarira Dharanatva- In Upadhatu this function is supportive to Dhatus
Dhatu functions right from conception and continue	Some Upadhatus (Raja & Stanya)

Aartava (raja)

Raja is present only in females. This is derived by means of specific function attributed to female physiology that is reproduction. This is called as *Upadhatu* because they derive their nourishment from *Prasadaja* portion of *Dhatus*. This is present in liquid state. Raja is the menstrual blood. Menstruation is intimately correlated with the normal functional states of the female and it is an index of her well being. As in developing and aged plants flower and fruits do not come up, as in bud and decaying flowers or fruits the fragrance is not explicit, similarly in females Raja (menstrual blood). The Raja or *aartava* is produced from the Rasa only in women and is manifested for 3 days once every month. Raja is produced after 12 years of age and ceases to appear (menopause after 50 years).

Rasa gets matured and processed over a period of one month and at the end of the month, the rasa gets converted into *shukra* (semen) in men and *artava* (menstrual blood, ovum) in women. Rasa majorly nourishes *Rakta dhatu* and in quick time too, whereas the same rasa nourishes the raja or *aartava* in small proportions and in slow time. Therefore it takes one long month for the *aartava* to get properly nurtured and get manifested during monthly periods, while *rakta dhatu* is regularly produced.

Raja & Panchamahabhuta

The principles of *Panchamahabhuta* are also present in male and female reproductive elements in their subtle forms and contribute to the formation of the material parts by their molecular adjustment in the way of supplying nutrition, adding to their bulk. In female, raja the purest part of *rasa-dhatu* plays a very important role along with *artava*. However, this relationship of raja and *artava* is not mentioned properly anywhere in *Ayurvedic Samhitas*. Being the purest part of *rasa dhatu*, it contains all the nutrients, which assists the growth of embryo by the osmo-regulation method. The following characteristics of *Aap mahabhuta* as stated in *Ayurveda* are also found in raja.

1. **Rasa:-**With the help of rasa, the effect of the *dravyas* can be left to a certain extent, e.g., drugs having sweet taste lead to the growth of all tissues and increase the functional capacity. Since raja helps the growth and development of fetus, it is having the sweet taste.
2. **Sarvadravysamuha:-**Basically it exists in liquid state, that is, water balance in the body, moisture, all types of secretions, hormones etc. In the same way raja is also found in liquid state.

3. **Guruta:-**Every liquid substance has its own weight. Similarly, raja must have its own weight.
4. **Shaitya:-**Like *Aap mahabhuta*, *shaitya* is also one of the major features of raja as proved above.
5. **Sneh:-**Property of *rasa-dhatu* is mentioned as *Snigdha*. Raja being its *upadhatu* its property may also be regarded as *Snigdha*.
6. **Ret:-**In general this 'Ret' means semen or *Shukra dhatu* in male. It is not considered in female. But as raja is considered as *stree shukra* it gets discharged from the body in *rajakala* with this discussion we conclude that though *rajah* is composed of the *Panchamahabhuta*, the property of *Aap mahabhuta* is found more in it. So, it can be argued that the property of raja is *Soumya* and it should be regarded as *Stree-shukra*. Here we have to keep in mind that the body temperature of a woman is increased at the time of ovulation (*Agneyam Aratvam*) but at this juncture, raja retains its *sheeta guna* which is composed of *Panchamahabhuta* with the dominance of *Aap mahabhuta*.

Raja and Tridoshas

Menstrual flow occurs by every 28 to 30 days. But woman normally experiences regular uterine bleeding coming out every 28 days, except during pregnancy and sometimes during lactation. This cyclical uterine bleeding is called *rajodarshan*. While the period from the beginning of one menstruation to that of the next is called the menstrual cycle. From the onset of menstruation, the first period of 3 to 5 days is called *Rajodarshan* or *Rajapravrutti*. It is also called as *Rajakal*. After *rajakal*, the period of 12 to 16 days is called *Rutukal* and thereafter the period up to menstruations is known as *Rutuvyatitakal*. In this way the cycle completes within 28 days.

Rutukala and Tridosha

After menstrual flow, the uterus becomes clean to form a new raja. In modern science this stage is known as proliferative stage. Here in this stage, *Kapha dosha* does the work of accumulation in the body. Therefore, it is responsible for the creation of new raja. During this period, *Kapha dosha* remains very active in its function. So, it should be considered as '*Kaphaprakop Kala*' whereas at this stage *Vata dosha* remains passive, after having performed its function in *rajakal*. The *pitta dosha* is in the accumulative state, as it has to perform its function during the *rajovyatit kala*. If fertilization occurs during this period the *pitta-dosha* helps the fertilized ovum to grow. If the process of fertilization does not occur, *pitta-dosha* goes on increasing and at its extreme stage with its *ushna guna* liquefies the layers of raja and

consequently raja is thrown out along with blood. Ovulation takes place in this *rutukala*. The period of forming the ovulation is the same as mentioned in the modern science, that is, 14 ± 2 . With this discussion, we can conclude that *kapha* is in its dominant position, *pitta* is in its accumulative stage and the *vata* is in passive stage during the *rutukala*.

Rutuvyatitakala and Tridosha

Rutuvyatitakala commences soon after the *rutukala* is over. During this stage *pitta* becomes dominant whereas *Kapha* is found in its passive stage, as it has no function to perform. *Pitta* becomes forceful to help the growth of the fertilized ovum if at all fertilization takes place. If it does not, it destroys the layers formed by *kapha dosha* with the help of *ushna*, *sara* and *drava guna*. *Vata* is in its growing stage because it has to perform its function in *rajakala*. Therefore, we can say that *pitta* is in active stage, *vata* is in growing state, and *kapha* is in passive state.

Rajakala and Tridosha

As raja has nothing to do, it is converted into waste product and that is why *vata* has to be very active to throw out the waste product. But it is noticed that *pitta* becomes inactive whereas *kapha* goes on growing. In *Ayurveda* the whole process is described as *tridoshas*.

Raja and Tridosha's Niyatakal

In *Ayurveda*, *Niyatakal* is one of the concepts. Age, day, night, and diet periods have their own basic divisions such as *Adhya*, *Madhya*, and *Antya*. *Kapha*, *pitta* and *vata* are very dominant in their above respective periods. As we have seen, menstrual cycle also has its own divisions, namely, *rutukala*, *rutuvyatita-kala* and *rajakala*. It is taken for granted that *rutukala* signifies the *Adhya* (beginning) in which *kapha* is dominant. The *rutuvyatita kala* is known as *Madhya* (middle), where *pitta* is active, whereas the *rajakala* is *Antya* (end) where *vata* seems to be forceful. As mentioned earlier, in *rutukala* there is a formation of new raja because of the dominance of *Kapha guna*. If a woman having *Kapha prakruti* takes food intake containing the excessive ingredients of *kapha guna*, the *rutukala* is deferred. It is observed that there is a close connection between *rutukala* and excessive *kapha*. During *rutukala* the production of ovum takes place. It is followed by the inception of the *rutuvyatit kala*. During this period temperature of female body increases to some extent. Hence this period should be regarded as *pitta* dominated period. If *kapha* in *rutukala*, *pitta* in *rutuvyatita kala* and *vata* in *rajakala* continue to grow excessively, the basic principle regarding *niyat kala* gets distorted, consequently raja is vitiated. Therefore, the *doshas* have to be made inactive in later states, which help to maintain the balance of *doshas*. In this regard *Chakrapani* pertinently remarks that the *doshas* grow sometimes excessively as per physical needs. Their growth should not be regarded as a diseased state. This process is in

keeping with the natural law. Here the term 'excessive' growth should be taken in a limited sense.

DISCUSSIONS

Though by name they are sub-tissues or secondary tissues, the *upadhatu*s render very important functions in the body. Without *upadhatu*s many important functions could not be imagined. *Stanya* is helpful in lactation, *aartava* in regular cleansing and maintenance of health in woman and also in reproduction, *siras* help in circulation, *kandaras* and *snayus* help in supporting the body and holding the body tissues together, *vasa* helps in lubrication and *twak* in enveloping the body, protection and beautification and *sandhis* help in our movements and locomotion. Imbalances in *upadhatu*s in the form of pathological increase (*vridhhi*) and or decrease (*kshaya*) will lead to many diseases and deformities. Therefore it is important to know in detail about *upadhatu*s, their location, types, number and functions. *Updhatu*s are the byproducts of the *Dhatu* metabolism but they cannot be considered as the *Malas* because *Updhatu*s are nourished by the *prasadaj* part of the *Dhatu*. *Raja* and *Stanya* is *Streevishishta Updhatu*. *Raja* is a sub-stance of the body which flows out at a specific time or period that is monthly menstrual flow. The "Raja" is the secretion from the genital tract of female body throughout their reproductive life. Normal and proper *Rajapravritti* is one of the indications of *Swasthavastha*. It is one of the most essential factors for the healthy progeny. In high tech era, Woman have successfully taken leap from kitchen to the corporate world, but at the same time added their health risk due to that they forget all about reproductive cycle or biological clock, changing life style, eating habit, over mental and physical stress, Improper sleep ultimately all these disturbs body physiology influence proper nourishment of the body, causing wide range of medical ailments especially regarding female reproductive health. Among them menstrual disorder is very common problem.

CONCLUSIONS

Ayurveda has aimed to maintain health of healthy individuals and to cure diseased person. The basic elements of the body *Dosha*, *Dhatu*, *Mala*, maintain homogeneous state (*Samya*), of our body that is important for *Arogya*. Among these *Dhatu*s is nothing but the pillars of the body on which whole body grown up above. *Updhatu* is derivative of *Dhatu*. The *Dhatu* nourishes the *Updhatu*, if *Dhatu* is in excellent state then its *Updhatu* production and nourishment will also be in excellent state. *Raja* (menstrual flow) being the *Updhatu*s of *Rasa Dhatu*; its quality, quantity excellence depends on metabolic and functional status of *Rasa Dhatu*. *Upadhatu*s are important components (structures) of our body serving important functions. The description of *upadhatu*s by *Ayurveda* teachers of ancient time explains the dexterity, analytical vision and the perfection with which the anatomy was understood, taught and documented in spite of having lesser

amenities for doing it. The different *Acharayas* at different periods of time enlightened the concept of *Updhatu* in their own ways. *Upadhatu*s do not nourish any successive. *Updhatu*s are basically nourished from the *Sukshma Prasadaj* part of the *Dhatu*, which also nourishes the subsequent *Dhatu*. *Dhatvaagni* and *Strotas* play an important role in the nourishment of *Dhatu* and *updhatu*s. Each *updhatu* has its own *dhatwaagni*. Normal and proper nourishment of *Updhatu* depends on their Status of their respective *Dhatu*. *Raja* is functional entities restricted to *Stree Sharira*. Proper *Rajapravritti* is one of the essential factors for female reproductive health.

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