

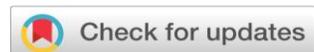
**PHYSIOLOGICAL ASPECT OF UPADHATU AND ITS CLINICAL IMPLICATIONS
W. S. R. TO SNAYU**Warkade Pravini Arun¹, Kothekar Maneesha², Mishra Snehavibha³¹P.G Scholar, Department of Kriya Sharir, Shri Ayurved Mahavidyalay, Nagpur, Maharashtra, India²Professor, Department of Kriya Sharir, Shri Ayurved Mahavidyalay, Nagpur, Maharashtra, India³Professor and Head, Department of Kriya Sharir, Shri Ayurved Mahavidyalay, Nagpur, Maharashtra, IndiaCorresponding Author: dr.pravini02@gmail.com<https://doi.org/10.46607/iamj1409122021>

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**ABSTRACT**

*Updhatu*s are important physiological units and are derived from *Dhatu*s and resemble *Dhatu*s in terms of structure, function and nature. *Dhatu*s are the seven basic fundamental principles that support the basic structure which hold the bodily elements together and the functioning of the body. *Meda dhatu* is fourth among seven *dhatu*s. During the process of metabolism and formation of *Meda Dhatu*, ligaments (*snayu*) are formed as metabolic byproducts (*upadhatu*). *Snayu* is the most important structure of the human body which helps to maintain the weight carrying capacity of the joint and plays a crucial role during the movement of the joint. The *Snayu* is much similar to the ligament. Any injury to the ligament is known as a sprain. Sprain is most common in sportsmen and hard workers. Common ligament injuries are to the knee, ankle, wrist, thumb, neck or back ligament with ankle injury being the most commonly occurring injury. So, the complete knowledge of *snayu* very essential to prevent such injuries and certain disease conditions.

Keywords: *Updhatu*, *Meda Dhatu*, *Snayu*

INTRODUCTION

Charak Samhita is the first ancient text which has mentioned *Upadhatu*s collectively as one unit.¹ Ancient seer of Ayurveda has classified the elements of the body under three fundamental components *Dosha* (a biological entity that regulates all the bodily functions), *Dhatu* (structural component includes seven tissues) and *Mala* (waste products).² The basic structural architecture of the body is formed by *Dhatu*s which are the most stable constituents of the body & form the substratum of the body. They act as a recipient for all the functions taking place in the body. There are seven *Dhatu* which is derived from *Ahara Rasa* that is *Rasa*, *Rakta*, *Mamsa*, *Meda*, *Asthi*, *Majja* and *Shukra*. *Snayu* is an important metabolic byproduct of *meda dhatu*.³ *Acharya Sushruta* in *Sharirasthan* has described the anatomical position of various structures, *Snayu* being one among them. The strength of the body depends upon *Snayu*, *Asthi*, *Mamsa*, etc. *Snayu* is an important structure that binds the *Mamsa* (muscle) and *Asthi* (bone) in the body thereby helping in weight-bearing.⁴ *Snayu* is the most important structure of the human body which helps to maintain the weight carrying capacity of the joint and plays a crucial role during the movement of the joint. Any traumatic injury to the joint causes severe pain, swelling, sprain and improper movement of the joint.

Snayu

Upadhatu of *Meda dhatu*. These are the body constituents that bind any 2 body structures at their joint. Such joints are called *Sandhi* in Ayurveda. Thus, they perform the function of holding the entire structure together. *Acharya Sharngadhara* mentioned *Snayu* as a structure that support the body by binding *Mamsa*, *Asthi* and *Medas*.⁵ Classics have described Nine hundred *Snayus*, of which 600 are present in *Shakha* (extremities), 230 in *Koshtha* (trunk), and 70 in *Griva* (neck) and above.⁶

Vyutpatti

The word *Snayu* is formed from the word root (*Dhatu*) 'Sna'. 'Sna' *Dhatu* when combined with 'un' and 'yuk' *Pratyaya* forms the word *Snayu*.⁷ From the unctuous portion of *Medas* both *Sira* and *Snayu* are formed, *Sira* arise from *Mrudu Paaka* and *Snayu* from *Khara*

Paaka. The essence of *Meda* is the *Asthi*, *Snayu* and *Sandhi*; and its waste is *Sveda*.

Nirukti

Vachaspatya states *Snayu* as a *Strilinga Shabda*. The etymology is similar to *Sidhanta Kaumudi*. Its function is to bind the body. Details regarding *Swaroopa* (appearance), function and *Sankhya* (number) have been adopted from *Bhavprakash*.⁸

The etymology of *Snayu* is similar to other texts as per in *Shabdakalpadrum*. Here also *Snayu* is mentioned as a *Srilinga Shabda*.

Material and Methods:

This article is based on a review of Ayurvedic texts. Materials related to *Updhatu* and *snayu* and their clinical relevance have been collected. The main Ayurvedic texts used in this study are *Charaka Samhita*, *Sushruta Samhita*, and available commentaries on these. We have also preferred the modern texts and searched various websites & reports to collect information on the relevant topics.

Physio-Anatomical type of Snayu

Snayu is described as 'Vaatavahini Nadi' (Structure carrying *Vata*).⁹ In Ayurveda, four types of *snayu* have been described¹⁰ -

Pratanavathi Snayu (Branched)- this type of *snayu* is present in all extremities and all joints

Vrutta Snayu- *Vrutta snayu* are circular and are known as *Kandara* in Ayurvedic Anatomy.

Sushira Snayu- *Sushira snayu* are porous and are found at the end of the stomach, intestines and urinary bladder.

Pruthu Snayu- they are flat and are present in sides, chest, back and head.

Structure and functions of Snayu

Snayu is a type of extra-articular or subsidiary tissue that plays an essential part in the human body's posture. Similar to how a boat made of planks can carry a load of passengers down a river after being correctly connected with a bundle of ropes, all *Sandhi* (bony joints) in the human body is tied with *Snayu*, which allows people to bear weight. *Snayu* compactly holds all the pieces of the human body together. The

Snayu binds the *Mamsa*, *asthi*, and *Meda* of the human body together.¹¹

Asthi (bones), *peshi* (muscles), *sira* (vascular structure), and *Sandhi* (joints) injuries may not be as serious as *Snayu* injuries.¹² As a result, they should be protected from injury more than *Asthi*, *Sira*, and others. *Snayu* is a structure found in *Madhyama rogamarga*¹³ (the Middle Route for Disorders), while diseases found in *Marma* and *Madhyama Rogamarga* are referred to as *Krichha Sadhya*. *Snayu*, *tvaka*, and *raktavahini dhamani* are the root of *Maansavaha strotasa*, and when they are harmed, they cause swelling, muscular wasting, varicosity, and death.¹⁴

Snayu Marma

Marma refers to the vital points in the human body where Prana can be found. These points are the conglomeration of *Mamsa*, *Sira*, *Snayu*, *Sandhi* and *Asthi*. *Snayumarma* refers to specific locations of the human body where the *Snayu* component is predominant. Injury to these *Snayu marmas* mostly leads to *Vaikalya* (deformity) in the body. Injury to *Snayumarma* can also cause convulsive disorders, extreme pain, stiffness, impairments, feelings of discomfort in all settings, and even death.¹⁵

Clinical implications:

1. Snayu Vikar

Diseases of the joints are better known as rheumatic diseases. *Sandhigatavata* (Osteoarthritis), *amavata* (rheumatic arthritis) and *Vata Rakta* (gout) are the common forms of arthritis seen in clinical practice.

According to Acharya Charak, *Stambha* (stiffness), *Samkocha* (contraction), *Khalli* (twisting pain in upper and lower limbs), *Granthi* (nodules), *Sphurana* (throbbing), and *Supti* (numbness) are symptoms of *Doshas* vitiated in *Snayu*, *Sira*, and *Kandara*. Acharya also explained, when *Vata* in *Snayu* is intensified, it causes *Bahyayama* (opisthotonus), *Antarayama* (emprosthotonus), *Khalli*, *Kubjata* (kyphosis), and other generalised or localised disorders.¹⁶

Stambha (stiffness), *Kampa* (tremor), *Shula* (extreme pain), and *Akshepana* (convulsions) are symptoms of exacerbated *Vata* in *Snayu*, according to Acharya Sushruta.¹⁷ *Kubjata*, *Shariravayava Avasad* (debility of body parts), *Kriyasvashakti* (inability to do acts),

Ruja (extreme pain), and wound healing after a long time can all be understood as being produced by injury to the *Snayu*.¹⁸

2. Snayu Gatavata

In Samhitas, it is discussed under the notion of "*Vata Vyadhi*."¹⁹ It is characterised by widespread musculoskeletal discomfort and weariness.

The *Chala Guna* of *Vata* plays a role in practically every *Vata Vyadhi*. When *Vata* is vitiated, it might lead to the development of certain diseases. *Vata* acquires *Dushita* owing to various *Aharaja*, *Viharaja*, *Karmaja*, and *Manasika Hetu*. The *Prakupita Vata* moves and becomes localised in specific *Sthanas*, disrupting the usual functioning of those *Sthanas*. This notion is related to *Snayugata Vata*, in which *Vayu* becomes vitiated as a result of numerous *Nidana Sevana*, and this vitiated *Vata* gets *Ashrita* in *sandhi* like *Kurpura Sandhi*.²⁰

DISCUSSION

The description of *Snayu* in terms of its structure, location, and clinical characteristics is very important in Ayurveda. *Snayu* is a vital structure that connects the *Mamsa* and *Asthi*; it could be a ligament, tendon, aponeurosis, or sphincter muscle, although ligaments are the most fitting structure for the name.

Snayu is defined as *Vatavaha nadi* and *Vata* is responsible for any type of pain in the body. It may be the reason why injury to *Snayu* leads to severe pain than any other structure in the body. *Prana vayu*, which is located in the *Murdha* (head), may travel throughout the body via *Snayu*, which is why the *Mastulunga* is known as the *Moolasthan* (root) of *Snayu*.²¹ Acharya Sushruta mentioned that *Snayu* is *Shanakara*. *Snayu* is used for tying a bow and as a *Seevan Dravya*. Again, in the context of *marma*, a type of *marma* is named *Snayumarma* because it resembles *Snayu* in appearance.²²

According to a commentary by Dalhan, it is said that *Snayu* appears to be binding Sharira Avayava. A review of contemporary science reveals that *Mamsa* is bound to the bones by ligaments and tendons, the bones are bound together at each joint by ligaments. Suspensory ligaments are ligaments that hold the fatty

structure of the breast in place. This proves that *Medas* is held or bound by ligaments as well.

Ligaments and tendons are similar in structure but differ in the way they are attached. Fascia is also fibrous and covers the muscles, hence can be included under *Snayu*.

As per *Methrayani Upanishad*, the body is formed by bones bound strongly by *Snayu* which is covered by *Mamsa* and *Shonita* and finally covered by skin. In this context, we can say that *Snayu* term indicates the ligament because ligaments are connected bone to bone.

According to Ayurveda, vitiated *Vata* is the principal cause of disorders associated with *Snayu*, and the disease is known as *Snayugata Vata*. The main symptoms of *Snayugata Vata* are extreme pain, joint stiffness, delayed wound healing, inability to move the joint, and so on. As a result, when this type of sickness is treated with a vitiated *Vata* regimen, symptoms are relieved. *Snehana*, *Swedana*, *Agnikarma*, *Basti*, *Bandhan*, *Mardhan*, and other generic remedies for *Snayugat Vata* are utilised, depending on the condition.

CONCLUSION

Acharya Charaka has introduced the Concept of *Upadhatu*. Commentators have contributed significantly to illustrate the Concept. *Upadhatu*s are closely related to the *Dhatu*s. *Snayu* is an important structural entity evolved to bear body weight. It is closely related to *Vata dosha*, whereas *Snayugata Vata* is a painful clinical ailment of the joint caused by worsened *Vata* and treated with a *Vata* regimen and joint bandaging. As a clinician, we need to focus on preventive and curative aspects of diseases related to *snayu*.

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