

**CRITICAL REVIEW ON MAJJAVAHA SROTAS, DISORDERS DUE TO ITS VITIATION
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ABSTRACT

Ayurveda is ancient science that is based on three major principles i.e. *Dosha*, *Dhatu* and *Mala*. Here *dosha* regulates the all physiological functions of body, *Dhatu* provides the nourishment to body while *mala* are the waste matters of body metabolism. *Majja* is second last *dhatu* that provide nourishment and strength to the body, fills the internal cavities of bones and also associated with nervous system. The channel that provide nutrition to bone marrow called as *Majjavaha srotas*. It includes Central, Peripheral and central nervous systems. It has origin in brain, spinal cord and joints. This *srotas* responsible for filling spaces in the bones, capability of displaying emotions, opinions and thoughts. The present study elaborate the concept of *Majjavaha srotas* and its modern concept, factors responsible for its vitiation and associated disorders and treatment protocol along with commonly preferred herbs in its management.

KEYWORDS: *Majjavaha srotas*, treatment protocol, herbs.**INTRODUCTION**

The body contains numerous channels through which the *dhatu*s (tissue elements), *doshas* (physical humors), and *mala* (waste material) circulate, known as *srotas* in Ayurveda, these consist of both gross channels, such as the intestinal tract, lymphatic system, arteries, veins, and the genitor-urinary tracts etc. *Dosha*(vitiating factors or physical humors), *dhatu* (tissue elements) and *mala* (waste products) are the basic building elements of the body. In glance, we can say that, these are the channels of tissue transformation. *Charaka* described 13 main *Srotas* in *Vimanasthana* on the basis of their origin and abnormalities produced in them due to their vitiation.^[1] *Majjavahasrotas* is one among the *Abhyantara srotas* enumerated by *Charaka* which can be correlated with the channel carrying the bone marrow tissue. As per the ancient literature its *moolasthanas* (root/origin) are *Asthi* (bones) and *Sandhi* (Joints). On vitiation these of *Majjavaha srotas*, it causes symptoms like *Bhrama* (giddiness), *Murchha* (loss of consciousness), *Tamodarshana* (vertigo or blurring of vision), *Parvaruk* (pain in interphalangeal joints), *Aroomshi* (Seborrheos or Pityriasis) etc. which resembles to neurological as well as osteoporotic changes explained in modern medical science. Thus to understand the concept of *Majjavahasrotas*, it is very important to understand the concept of bone marrow and pathophysiology of disorders that causes due to bone marrow and neurological dysfunctioning.

OBJECTIVES

- To explore the concept of *Majja dhatu*, *Majjavaha srotas* and disorders associated with them.
- To elaborate in terms modern medical science.
- To understand pathophysiology of associated disorders and establish the Ayurvedic treatment protocol.

MATERIALS AND METHODS

Literature revived from ancient Ayurveda classical texts and contemporary science.

CONCEPT OF SROTAS

According *Ayurveda* classic '*Srotamayam hi shariram*' means the whole living body is channel or compositions of various channels or systems. *Srotas* are so called because they have '*sravana*' (oozing) means allow materials to pass through them in slow process.^[2] *Srotas*, in broad term refers to the channels of circulation present in the human body.

Due to morbidity of *Srotas* i.e., channels pertaining to various *Sharira-dhatu*(tissue elements). These are *Poshakadhatu* (for nourishment), *Asthyadidhatu* (for circulation of metabolites), *Margagdhatus* (moves within the channels). *Sarira dhatu* whether in passage (under the process of transformation) or in location (fully transformed state) also set affected. Likewise, morbidity

of other *srotas* affects the respective contents. The ill effects in *Srotas* affect the tissue elements and the respective organ.^[3]

Sushruta describes *Srotas* as structures which originate from vacant spaces (hollow organs), spread throughout the body and purvey materials or elements.^[4] Anatomically and physiologically, channels of circulation have great importance. These paths circulate *mana* (consciousness), *prana* (life forces or vital principles), *anna* (food), *jala* (water), *dhatu* and their *upadhatu* (tissue elements), *mala* (waste products) etc. by the channels. Thus these channels are infinite in numbers.^[5]

According to *Charaka*, these are channels of circulation which mainly carry *Dhatu* (tissue element) undergoing transformation to their destination. Thus he only explain 13 types of *srotas* where 7 for all *dhatu*s i.e. *rasa* (life sap), *rakta* (blood), *mansa* (muscles), *meda* (fatty tissues), *asthi* (bones), *majja* (bone marrow and nervous tissues) and *shukra* (semen), 3 for all *mala* i.e. *mutra* (urine), *purisha* (fecal matter) and *sweda* (sweat) while remaining three for *prana* (life forces), *anna* (food), *jala* (water).^[6]

The different places where these processes take place are known as '*Srotas*'. According to *Charaka*, the term '*Srotas*' carries various meaning like *Sira* (vein), *dhamani* (artery), *rasayani* (lymphatic channel), *rasavahini* (capillaries), *nadi* (duct), *panthaan* (passage), *marga* (track), *sthaan* (balanced position), *ashaya* (location/reservoir) etc. are the names of visible and invisible spaces within the body.^[7]

Sushruta describes *Srotas* as structures which originate from vacant spaces (hollow organs), spread throughout the body and purvey materials or elements. *Charaka* defines *Srotas* as transporting channels of *dhatu*s (tissue elements) undergoing transformation (intermediary metabolite). Anatomically and physiologically, channels of circulation have great importance. These channels of circulation are present in intra-cellular, inter-cellular and extra-cellular spaces of the human-body. These channels has appearance like the respective *Dhatu*, shape is *vrutta* (circular), *sthula* and *anu* (small). It resembles with shape of *pratana* (tendrils).^[8]

Mulasthanas

Mulasthanas or *Srotomula* is the 'area of influence'. *Chakradutta* is the commentator of *Charaka*, who describes *srotomula* as the area from which *Srotas* evolves or arises (similar to root of the tree). The *mulasthan* or the source is so considered that without which the origin, maintenance and destruction of that specific carrier of the body nutrient cannot be possible. This particular part regulates and controls the functioning of the entire *srotas*.^[9]

CONCEPT OF MAJJA DHATU

Majja dhatu

Majja is considered to be the *Sara bhaga* (essence portion) of *Asthidhatu* (bone tissue). It is just like the *Sara* found inside the tree. According to *Vachaspathyam* and *Shabdakalpadruma*, *Majja* is the unctuous part found inside *Asthi*.^[10] But here the most important question arises that bone tissue has coarse attribute and bone marrow is said to get its origin from bone tissue which possess the properties like *snigdhatu* (i.e. smooth and fatty) and *mrudu* (i.e. soft) qualities. How it is possible? Here regarding the total conversion of previous *dhatu* into next *dhatu*, the only *sarabhaga* (essence portion) of previous *dhatu* is converted into next higher *dhatu* while the *mala bhaga* (waste portion) is excreted from the body. In this process the *malabhaga* of *asthi*^[11] are *Kesh* (Hairs), *Nakh* (nail), and *Loma* (small hairs all over the body). While after formation of *Majjadhatu*, This *majjadhatu* produces bone marrow then converted into *Shukradhatu*^[12] from its *sarabhaga* while its *malabhaga* produces oleaginous waste material of eyes, skin, faeces.

Formation and structure of Majja dhatu

Vayu causes porosity in the interior of bones and this porous space gets filled up with *Majja* (Bone marrow).^[13] According to *Sharagadhara*, *Majjadhatu* gets originated from its previous *dhatu*- *meda* (fatty tissue). *Majja dhatu* is formed from *Meda* by *Uttorottara Dhatu Poshana Nyaya*.

Majja resides in long bones middle part specially. According to *Ayurveda*, brain is made from *Majja* that is responsible for Intelligence and psychological functioning of the body. Thus as per the modern concept *marga* (Channel of influence) of *Majjavaha srotas* can be considered as Central, sympathetic and parasympathetic nervous system (Autonomic) while the *mukha* (origin of influence) of *majjavaha srotas* is synaptic space.

Properties of Majja Dhatu

The marrow enhances the strength of *Sukradhatu* (reproductive tissue), *Rasa Dhatu* (essence of nutrition circulates through arteries), *Kapha*, *Medo dhatu* (fat tissues) and *Majja* (marrow). It adds to the physical strength, especially of the bones and tissues.^[14] It is heavy and unctuous.

Quantity of Majja in the Body

Anjali pramana of *Majja Dhatu* is one *Anjali*^[15] (160-170gms).

Panchbhautik Constitution of Majja dhatu

According to *Dalhan* commentary on *Sushruta samhita*, it has predominance of *Jala Mahabhuta*.

Location of Majja dhatu

Majja being a *Dhatu* it should be present throughout the body. It may be present in certain places in large quantity

and functioning specifically within these places. Such places can be concluded as the locations of *Majja dhatu*. It is present *Majjavaha Srotas* and gets circulated throughout the body along with these channels.

Asthi (bones) and *sandhi* (joints) are considered as *mulasthanas* of *majjavahasrotas*.^[16] *Majja* is basically found in long bones in human body. It is one among the *Abhyantara Srotas* explained by *Charaka*. *Majjavaha Srotas* is not mentioned by *Susrutha* because he has explained *Srotas* on the basis of *Viddha Lakshna*. In the context of *Asthi bhagna* he says that when injury occurs to *Asthi*, *Majja* will come out and cause complications.

According to *Ashtanga Samgraha*, *Parva* (joints of small bones) and *Asthi* (bones) are the *Mulasthanas* of *Majjavahasrotas*. The bone marrow occupies the internal cavities of bones. At birth these cavities are filled entirely with red bone marrow but in later life the marrow in limb bones is replaced by yellow bone marrow. Fatty yellow bone marrow is placed in diaphysis or body or shaft of long bones and red bone marrow is found in spongy bone tissue of long bones. In present situation, with *sandhi* section it is necessary to consider

complete lower end of one bone and entire upper end of other bone which takes part in *sandhi* configuration. So that's why it can be justified that *mulasthana* with origin and storage point of view.

Sandhis are lined by *Shleshmadhara-kala*, which is unctuous. Hypothetically this must be helping in transmitting outer *Medodhatu* to inner cavity of bone, As *Majja* is generated in this thus it exists in all joints and thus called as *shleshmadhara kala*. As the oiling of axis of wheel keeps movements of wheel in proper condition, this adhering *Shleshma* keeps human joints in appropriate condition^[17]

Upadhatu (subtissues or secondary tissues) and Mala (waste matter) of MajjaDhatu

According to *Sharangdhara Upadhathu* of *Majja* is *Kesha* (hairs).

Charaka and *Susrutasays*, the *Mala* of *Majja Dhatu* is unctuous secretion of *eyes* and *skin*. *Vagbhatta* says *Sneha* or unctuous secretion of *Purisha* (faecal matter) is also considered to be the *Mala* of *Majja*.

FUNCTIONS OF MAJJA DHATU^{[18],[19]}

1	<i>Snehanam Karoti</i> (Oleation)	<i>Majja Dhatu</i> is known as best for <i>Snehan</i> (oleation). It oleates and nourishes body organs.
2	<i>Balakrita</i> (Strengthening of body):	It is the main source of strength in body, especially for bones
3	<i>Shukra-Pushtim</i> (nourishment of reproductive tissues)	<i>Poshaka Shukra dhatu</i> is formed during the metabolism of <i>Majja dhatu</i> . Thus the nourishment of <i>Shukra dhatu</i> is the function of <i>Majja dhatu</i>
4	<i>AsthanamPuuranamKaroti</i> (filling of bones)	Bones contain small pores due to the activity of <i>Aakashas</i> and <i>Vayu Mahabhuta</i> and <i>Majja</i> fills the porous gap with fatty tissue and provides strength to the bones of the body otherwise due to <i>Ruksha Guna</i> in bones, <i>Vata dosha</i> increases and <i>Asthi Bhangurta</i> (easily gets fracture of bones) will occur. In the absence of <i>Majja</i> , <i>Asthi Daurbalya</i> (weak bone), <i>Shunayta and Laghuta</i> (Increase in porousness in bones).

Majja-Vruddhi (Symptoms of increased majja dhatu)^[20]

Majja (marrow), when increased produces heaviness of the eyes and the body, increase of size of the body joints and causes ulcers which are difficult to cure.

Majja-Kshaya (Symptoms of decreased majja dhatu)^[21]

Asthi Saushirya (porous bones), *Asthi Daurbalya* (bone weakness), *Asthi Laghuta* (bone lightness), *AsthiNistoda* (sound from bones during walking), *Pratam Vata Roga* (various disorders caused by *vata* like neurological, degenerative etc.), *Alap Shukrata* (less potent reproductive tissues), *Bhrama* and *TimirDarshnam* (vertigo) etc. occur in *Majja Kshaya*.

Characteristics of Majja Sara (Excellence of majja dhatu)^[22]

Individuals having the excellence of *Majja dhatu* or marrow are characterized by softness of organs, strength,

unctuous complexion and voice and robust long and rounded joints. Such individuals are endowed with longevity, strength, learning, wealth, knowledge, progeny and honour. A man with a thin and sinewy body and who exhibits traits of excessive strength and possesses a deep resonant voice and who is successful in every walk of life, should be looked upon as one in whom the principle of marrow preponderates. According to *Sushruta*^[23], *Maha netra* (Big eyes) is the main differentiating symptom of *Majja sara*.

Majja Pradoshaja Vikara (Symptoms of vitiated majja dhatu)^[24]

- *ParvaRuk* – Pain in small joints.
- *Bhrama* – Delusion, Dizziness.
- *Murcha* – fainting, loss of consciousness.
- *Tamodarshana* – seeing darkness in front of eyes.
- *Arumshi* – Manifestation of deep-seated abscesses in joints.

Pathology of vitiation of Majjadhatu^[25]

After the accumulation and aggravation in the *maha-srotas* (digestive system), the *doshas* overflow into the *rasavahasrotas* and *raktavahasrotas* then relocated into the *majjavahasrotas* and *majjadhatu*. While any dosha can relocate into the *majjadhatu*, pathologies of the nervous system are termed *Vatavyadhi* are occurs. Thus, nerve pathologies cause symptoms commonly associated with *vata*, such as pain and alterations of motion. Even still, not only *vata-dosha* is not always the cause of the problem. *Pitta* and *kaphadosha* also causes vitiation of *majjavahasrotas*. Vitiation of *pitta-dosha* leads to inflammation and over a long period of time can burn out the myelin and nerve tissue. Vitiation of *kaphadosha* may slow down nerve conduction, decrease the rate of processing information or cause blockages resulting in the aberrant flow of nerve impulses. *Amafurther* complicates the condition when present.

Psychology and Majja dhatu^[26]

On a psychological level, *majja* provides our sense of fulfillment, filling the void that we experience within. When *majjadhatu* is healthy, there is a sense of fullness and completion. When deficient, there exists a hollow feeling of emptiness. In excess, there is the feeling of stagnation that comes with being too full. Neither the body nor mind wants to move or work. There is a loss of motivation.

In the subtle body, the *majja dhatu* is dependent upon the flow of *prana* primarily through *svadhisthana* and *anahata chakras*. Through these chakras the qualities of water and air circulate respectively.

MAJJAVAHA SROTAS

Human body appears to be accumulation of *Srotas* (channels) and proper functioning of these channels is the cause of good health. The food and regimen that promote morbidity and go contrary to the well-being of *dhatu*s (tissue elements) vitiate channels. Affliction of these channels leads to the vitiation of tissue elements residing there or passing through them, as vitiation of one leads to the vitiation of another. The vitiated channels and tissue elements vitiate other channels and tissue elements respectively. *Majjavaha srotas* is such channel that carries the nutrients to the bone marrow and nerves including brain. It includes central nervous system and peripheral nervous systems.^[27]

According to *Charaka*, *Majjavaha srotas* are affected due to crushing, excessive bath, injury, compression and constant use of antagonistic food.^[28]

The main signs of the vitiation of the channels are.^[29]

1. *Atipravrutti* – increased flow of contents of the channel;
2. *Sanga* – obstruction of the flow of contents of the channel;
3. *Siragranthi* – appearance of nodules in the channel;

4. *Vimargagamana* – diversion of the flow of contents to improper channel.

Factors responsible for vitiation of Majjavaha srotas

- *Virrudha Ahara* (eating wrong combinations or incompatible food).
- Lack of sleep
- Stress affects *Majja* tremendously
- Extreme sexual intercourse
- Fractures or any physical trauma especially to skull and spinal cord
- Over indulgence in Caffeine, Alcohol and drugs
- Suppressed emotions such as fear, worries, anger and criticism
- Exposure to radiation and Heavy metals
- Bacterial and viral inflammations.

Symptoms of vitiation

- Dizziness, Lack of stability and equilibrium.
- Loss of memory. (Long or short term)
- Burning or coldness of feet and hands.
- Joints which are swollen, painful or sometimes absence of sensation.
- Lack of sleep and Fear or anxiety.
- Numbness and tingling sensations in organs.
- Trembling or tics or spasms.
- Ringing ears and dark circles around the eyes.
- Talk disorder. (such as: stuttering)
- Sensitivity to noise. (Means *Vata* is aggravated in *Majja*).

Diseases

- Bell's palsy.
- Paralysis.
- Alzheimer's disease
- Multiple sclerosis.
- Aplastic anemia.
- Parkinsonism.
- Sciatica.
- Osteomyelitis.
- Vertigo.

Factors affecting majja dhatu and Majjavaha srotas

(1) Prakriti (Body constitution or body type): Prakriti plays a major role in determining the quality of *Dhatu*. This is indicated by description of specific characteristics of persons possessing *Vata*, *Pitta* and *Kapha* dominant *Prakriti*. This indicates that persons with *Kapha* dominant *prakriti* having dominance of *prithvi* and *aapa mahabhuta* possess better quality of *Asthi dhatu*.^[30] As *majja dhatu* originated from *Asthi dhatu*, thus as per *Kedarkulya nyaya* i.e quality of *dhatu* depends on quality of previous *dhatu*, As a result *majja dhatu* formed of better quality. On the other hand *Vata prakriti* persons has predominance of *Vayu mahabhuta* thus these having *Alpa-sharira* (small stature), possess *Anu-asthita* (small bones), *Chal Asthi Sandhita* or *Sashabda sandhi* (sound from joint during movement), *Alpa-parusha-Kesha-*

Roma-Nakha-Dashana (less and dry hairs, nails, teeth).^[31] This represents inferior quality of *Asthi dhatu*. So, *Majja-pushti* is also of inferior quality. Persons of short stature and less body weight have low bone mass. *Vata Prakriti* persons are lean and thin.

(2) Bala (Strength) - Overall body weight affects *Dhatu* metabolism. According to Charaka, Natural or original or non-vitiated *Kapha* also called as *Oja* responsible for Bala (strength) of the body.^[32] In strong persons rate of bone formation is more. Compared to men and women, men possess better strength, bone mass is more in men whereas bone loss is more in women. The living body can function normally only when its *Dosha, Dhatu* and *Mala* are in a state of equilibrium. These *Dosha, Dhatu* and *Mala* constitute the basis of the physiological and pathological doctrines of Ayurveda. This concept has proved to be effective in managing and preventing chronic ailments till date. Concepts of Ayurveda have been helpful in treating new diseases arising due to changing lifestyles and environment. This study was an attempt to understand the disease in Ayurvedic concept and find an effective therapy in preventing the disease.

(3) Age- Because of diminishing *Agni* in older age, all the *Dhatu* decrease in quantity and quality. Bone synthesis favors in youth and in old age favors resorption. Also peak bone mass is achieved at the age of 20 years and then bone loss begins which is accelerated in old age.

(4) Nutrients- *Asthi* and *Majja* both are formed from *Ahara Rasa* (the essence of food) in the process of formation of *dhatu*.^[33] Hence quality and quantity of *Ahara Rasa* can interfere with quality and quantity of *Asthi-Majja dhatu*. According to *Ashraya-ashrayi sambandha* of *Asthi* and *Vayu*, Thus the food which provoke *Vata* will cause diminished secretion of *Asthi Dhatu*. Less secretion of *Asthi-Majja Dhatu* containing nutritive part in food leads to poor formation of *Asthi* and *Majja Dhatu*. Calcium and vit-D (*Asthi Dhatu Posaka Amsa*) plays an important role in bone formation. Decreased calcium intake is a factor causing risk for developing osteoporosis.

(5) Physical Activities- Exercises etc. illuminate *Dhatavagni*.^[34] Bone responds to mechanical stimuli. When placed under mechanical stress, bone tissue increases deposition of mineral salts.

Modern correlation of *Majjavaha srotas*

According to modern it is said that there are two types of marrow i.e. Yellow bone marrow and Red bone marrow which can be correlated to *Majja* and *Sarakta-meda*.^[35] (*Su.sha.4/12-16*). The channel carrying nutrients to the bone marrow. It includes the PNS (Peripheral nervous system) and the CNS (Central nervous system).

The evidences say that Yellow marrow is found in the hollow interior of the diaphyseal portion or the shaft of

long bones. Red marrow is found mainly in the flat bones, such as the hip bone, sternum (breast) bone, skull, ribs, vertebrae, and shoulder blades, as well as in the metaphyseal and epiphyseal ends of the long bones, such as the femur, tibia, and humerus, where the bone is cancellous or spongy. By the time a person reaches old age, nearly all of the red marrow is replaced by yellow marrow. However, the yellow marrow can revert to red if there is increased demand for red blood cells, such as in instances of blood loss. This shows that the findings that have been done by our *Acharyas* were way great to the modern times.

Other *doshas* that also relating to this *srotas* are *Prana vata*^[36], *Vyana vata*^[37], *Ranjaka Pitta*^[38], *Sadhaka Pitta*^[39], *Kledaka kapha*^[40], *Avalambaka kapha*.^[41] However, the major ones governing this *srotas* are: *Prana vata, Sadhaka Pitta* and *Tarpaka kapha*. All these factors can correlate with the brain and its sensors functions. White matter – *Tarpaka kapha*, Gray matter – *Sadhaka Pitta*. *Majjavaha srotas* also includes the brain, spinal cord, sensory and motor organs.

Function of bone marrow

• Lymphatic role^[43]

The red bone marrow is a key element of the lymphatic system. As it is one of the primary lymphoid organs, it generate lymphocytes from immature hematopoietic progenitor cells. The bone marrow and thymus constitute the primary lymphoid tissues which are involved in the production and early selection of lymphocytes. Furthermore, bone marrow performs a valve-like function to prevent the backflow of lymphatic fluid in the lymphatic system.

• Disease resistance^[44]

Biological compartmentalization is evident within the bone marrow, in that certain cell types tend to aggregate in specific areas. For instance, erythrocytes, macrophages, and their precursors tend to gather around blood vessels, while granulocytes gather at the borders of the bone marrow. The cells in bone marrow can help in disease resistance.

• Red bone Marrow^[45]

It produces red blood cells, white blood cells and platelets. It gets its red colour from the haemoglobin in the erythroid cells. The haemopoietic stem cells mature into sinusoids to enter the circulation when they are formed.

• Yellow bone marrow^[46]

It contains mesenchymal stem cells that produces fat, cartilages and bones. It gets yellow colour from the carotenoids in the fat droplets in the high number of fat cells.

TREATMENT

General line of treatment

Healing the *majjadhatu* means restoring the proper balance of the qualities of water and air within the *dhatu*. This process begins with taking the qualities of the elements in through the senses and then properly digesting them. While dietary intake is always the most important factor in healing the physical body, the nervous system is particularly sensitive to input from all of the other senses as well.

Majja and *Shukra-dhatu* diseases are treated with diets and medicines of sweet and bitter *rasa*, proper sexual intercourse and exercise and timely elimination of *Doshas* through *Panchakarma* in proper quantity should be taken into consideration.^[47]

In order to treat ailments in *Majjavaha* srotas, one of the best treatments is Marma point therapy. Basti over the lower back area will be beneficial as well. At large, we seek pacifying *Vata* which had been aggravated in *Majja*.

Basti chikitsa explained in Ayurveda is best *Panchakarma* should be preferred in disorders causes due to vitiation of *Majja dhatu*. It should be administered on consideration of *dosha*, nature of disease and *prakriti* of the individual.^[48] In this process medicated *sneha dravya* administered through anal part of the body, from this it absorbed into *pakwashaya* then though *sira* it reaches into the head and nourishes the body by *veerya* and *prabhava* of medicated contains. As per the Ayurvedic concept, '*Pakwashaya*' extends from *guda* (anal region) to *Grahani* (small intestine).^[49] It is the *mulasthan* (source of origin) of *Purishvaha srotas*. *Grahani* is considered as *Pittadhara kala*. *Pittadhara kala* is not different from *Majjadhara kara* while *Purishadhara kala* is not different from *Asthidhara kala*. Thus it can be considered that *basti* has direct effect on *Asthi* and *Majja dhatu* both.

Herbs that are useful for *Majja dhatu*^[50]

Generally herbs acting on nervous system are used for this purpose. *Balya* and *Chakshushya* herbs are also very useful in treatment of vitiation of *majja dhatu*.

Tonifying and sedating herbs are preferred when *vata* enters into *majja dhatu*. Following herbs can be used can be given when vitiation of *majja* associated with vitiation of *vata dosha*.

1. *Ashwagandha* (*Withania somnifera*)
2. *Shankhapushpi* (*Convolvulus pluricaulis*)
3. *Bala* (*Sida cordifolia*)
4. *Jatamansi* (*Nordostachys jatamansi*)

Cooling and sedating herbs are useful when there is vitiation of *pitta dosha* and that causes vitiation of *majja dhatu*. The following herbs can be used in this condition

1. *Brahmi* (*Bacopa monniera*)
2. *Shankapushpi* (*Convolvulus pluricaulis*)
3. *Kapikacchu* (*Mucuna pruriens*)

4. *Vidarikanda* (*Pueraria tuberosa*)

When *majja dhatu* is vitiated due to *kapha dosha* then patient is treated with with light and mobile qualities which are given as follows:

1. *Vacha* (*Acorus calamus*)
2. *Tulasi* (*Ocimum sanctum*)

Rasayana Treatment

Brahmi (*Bacopa monniera*)

Family: *Scrophulariaceae*

Part used: Whole Plant

Rasa: Bitter, *Veerya*: Cooling, *Vipaka*: Sweet

Action on *dosha*: Balance all *doshas*.

Action on *dhatu*: *Rasayana* for *Majjavaha* and *Mutravha srotas*

It has very excellent action on *vata dosha* and sooth nerves. Fresh juice of its leaves in the dose of 5 ml daily in thrice a day dose is very useful in diseases like epilepsy, mania, hysteria. It also useful in improving memory and concentration.

Pathya (Diet and daily routine plan)^[52]

The best diet plan to fulfil the deficit of *Majja dhatu* in body is to increase the *Parthiva* and *jala mahabhuta* constitution. It is increased by using foods like milk and ghee. Here milk should always be taken warm for proper digestion while ghee should be added in food or milk also. The types of fats should be taken into diet are ghee, marrow, muscle- fat, oil. Slower activities such as swimming and yoga better support the healing process. Also the meditations like *bija-mantra* like '*yum*' and '*vum*' which increases the quality of air flow though *Anahata Chakra* and *swadhisthana chakra* also very useful in disorders caused due to vitiation of *Majja dhatu*. Patient should be advised to for more rest and avoid stressful situations.

DISCUSSION

In our body continuous formation and nourishment of *Dhatu* takes place from *Ahara rasa* (i.e. essence of food). For the proper nourishment of *Majja dhatu*, the nourishing part of *Majja dhatu* in *Ahara rasa* is necessary. Also the preceding *dhatu* is *Asthi* that is also plays an important role in nourishment of *Majja dhatu*. *Meda dhatu* which resides between bones in the formation of *Asthi dhatu* is called as *Majja dhatu*. So *meda dhatu* also plays an important role in formation of *Majja dhatu*. Also the *vata dosha* and *Asthi dhatu* are the fundamental base for any pathological condition or disorders in *Majja dhatu* due to their *Ashrayashrayi bhava*. Thus these factors can take into consideration for disorders of vitiation of *Majja dhatu*. In old age as increase in *vata dosha* and *Majja dhatu* less secretion leads to occurrence of various disorders.^[53] Thus for minimizing loss of *Majja dhatu*, ideal age of intervention can be beginning of age of *Hani* i.e. near about age of 40 years. As prevention is better than cure, the *rasayana* like *Chyavanprasha* which acts on all *dhatu* or *Brahmi*

which specifically acts on *majja dhatu* can prove to better choices to avoid disorders of *majja dhatu*. Also one should avoid the incompatible food, stress, extensive physical trauma and over indulgence in alcohol, drugs, caffeine etc. to avoid such disorders.

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