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## An Analytical Study of Trimarma in Brhattrayi

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#### **ABSTRACT:**

All the classics analogously opine for 107 *marma* in the body but on point of narration only three of them – *Trimarma* – Śiraḥ, *Hṛdaya* and *Vasti* are mentioned. An attempt has been made to compile, critically analyse the fundamental concept of *trimarma* on the basis of its derivation, scientific and literary review available in *bṛhattrayī* with objective of its importance. Introduction, definition, synonyms, anatomical features and structures, embryology, importance, functions and features of *marmābhighāta* symptoms for three individual *marma* has been quoted from *Bṛhattrayī*, journals, research papers and collected references are critically analyzed to frame conclusion.

*Trimarma* as *vasti*, *hṛdaya* and *śiraḥ* is gaining importance as tripod of life because they are more *sadhyoprāṇahara* than other *marmas*. External trauma injuries the *marma* and internal trauma caused by the vitiated *tridoṣa*, any disease afflicting to *prāṇāyatana*, complexity of disease and prognosis generally affects *trimarma* is more severe than others. This article can be helpful for better understanding the concept of *trimarma* in *Ayurveda* and its importance.

KEYWORDS: hrdaya, śirah, trimarma, vasti

#### INTRODUCTION

All the classics analogously opine for 107 *marma* in the body. *Caraka* tallied with the other classics opining for the total number of *marma*. But when it came to the point of narration then he elongated only three of them – The *Trimarma* – *Śiraḥ*, *Hṛdaya* and *Vasti*.<sup>[1]</sup>

Most of the *marma* were in reference to superficial (external) designated sites on the body. But some *marma* have some important organs situated underneath (internally) them. Thus those *marma* with such a position held a responsible place both anatomically as well as physiologically. Thus, they assume a greater importance than the others due to their two-pronged post. These *marma* play important role anatomically as well as physiologically. Anatomically any minor injury to them directly interrupts with the functions of the internal important organs. All such *marma* have *sadyahprānahara* characteristic and thus are the center of *agni* and *vāta doṣa* and so physiologically they play vital responsibility in maintaining the health. *Caraka* has given special importance to *vasti, hrdaya* and *mūrdhā* (*Śirah*) among all the *marmas*.

*Marmas* of the trunk are more vital than the *marmas* of extremities, as the extremities are connected to and depend on the trunk. Even among the *marmas* of trunk *hrdaya*, *vasti* and *Śiraḥ* are more important. *Prāṇa* are located in these three *marmas*, hence *doṣa* affecting these places also affect the *prāṇa*. Thus, a person should always protect these three parts carefully.<sup>[2]</sup>

An attempt has been made to compile, critically analyse the fundamental concept of *trimarma* on the basis of its derivation, scientific and literary review available in our classics with objective of its importance.

#### MATERIALS AND METHODS :

The material has been collected though a critical and thorough study of *Trimarma* in *Bṛhattrayī* by referring all its available commentaries to get fruitful conclusion. All available Ayurvedic classical texts regarding *Bṛhattrayī*, journals and research papers have been collected reference are critically assumed to frame this study.

#### **REVIEW OF LITERATURE :**

*Marma traya* are included in *prāņa āyatana* i.e. site of *prāņa*. This shows the importance of three *marmas* as expressed by *Caraka*.<sup>[3]</sup> As the base is destroyed, the dependent is also destructed. Likewise, the destruction of any of the three *marmas* may destroy the *prāṇas*. Hence, one should protect these three *marmas* from external as well as internal injuries.<sup>[4]</sup>

#### Śiras

The term Siras is derived from the root Sru with  $Asun dh\bar{a}tu$  which is meant in the following subjects <sup>[5]</sup>: That which is full of guna – Best qualities is Siras, that which remains on top, above other like a mountain or horn is Siras, that which is most important or of supreme significance is Siras, on which the other body organs dependent for their function is Siras, where all *indrivas* are located.

#### Definition

 $\bar{A}c\bar{a}rya\ Caraka$  in  $s\bar{u}tra\ sth\bar{a}na$  was the first to frame the definition of  $\dot{s}iras$  where he quotes  $\dot{s}iras$  is a structure or place situated at top in the body and therein resides the  $Pr\bar{a}na$  – soul of the livings with all the senses. So it is the best of all the organs.<sup>[6]</sup> This definition of  $\dot{s}iras$  promotes us to believe  $\dot{s}iras$  as Brain.

#### Synonyms<sup>[7]</sup>

#### Uttamānga, Śīrṣa, Mūrdh, Mastaka, Mastiṣka, Āditya, Mastulunga

#### **Anatomical features**

Though *Śiras* is counted within the *trimarmas ācārya Suśruta* has not shown any *marma* like *śiras* differently. It means none of our classics have designated any separate anatomical position to *śiras* as a *marma* or even as a *trimarma*. Though there is no any *marma* pointed out in our text as *śiras* but it is a group of *marmas* that forms the *śiras marma*. There are 37 *Urdhvajatrugata marmas* – *marmas* above the clavicle that are designated as *śiras marma*. Out of these 37 *marmas*, 17 *marmas* are *Sadyaḥprāṇahara*. The following underlines the names and types of *marmas* included in *śiras marma* by *ācārya Suśruta*<sup>[8]</sup>

- (1) Adhipati 1 Sandhi-marma Sadyahprāṇahara
- (2) Apanga 2 Sirā-marma vaikalyakara
- (3) Āvarta 2 Sandhi-marma Vaikalyakara
- (4) Phaṇa 2 Sirā-marma Vaikalyakara

- (5) Sthapanī 1 Sirā-marma Sadyahprāņahara
- (6) Śankha 2 Asthi-Marma Sadyahprāņahara
- (7) Śrŗngāțaka 4 Sirā- Marma Sadyaḥprāṇahara
- (8) Sīmanta 5 Sandhi-Marma Kālāntaraprāņahara
- (9) Utkșepa 2 Snāyu- Marma Viśalyaghana
- (10) Vidhura 2 Snāyu-Sirā- Marma Vaikalyakara

#### Importance of *śiras* as *trimarma*

In *Ayurveda śiras* is having prime importance among all the organs of body. Its passes the criteria to be included in *Trimarmas* as it has 37 different *marmas* on its hand. It is considered as *Uttamān̂ga* i.e. supreme, important and major part of the body. It is considered as principal vital organs of the body where the *prāṇa* i.e. life along with sense faculties resides. <sup>[9]</sup> All the sense organs and the channels carrying the sensory and vital impulses from the *śiras* are like the rays from the sun. This truly signifies *śiras* as a *trimarma* as it correlates it completely to the brain. Thus if there is any minor injury to the organ leads to death or disastrous symptoms.<sup>[10]</sup> *Ācārya Vāgbhața* has compared human being with a tree, with roots at the top and branches at the bottom and defined head as a site where all sense organs along with the *prāṇa* resides. Thus it is supreme of all organs as consciousness is present in it. Tree grows properly when its roots are free from diseases, similarly a man whose head is free of disease, possess sound growth.<sup>[11]</sup> *Kumāraśirā Bhāradvāja* emphasized that head of the fetus develops first, because it is the site of all the important *indriyas*. *Vāgbhața* has described ten "*Jīvitā dhātu*"<sup>[12]</sup> in which *śiras* (head), *hrdaya* (heart), *basti* (urinary bladder) are included. *Śiraḥ* upholds the *indriyas, indriyavaha* and *prāṇavaha Śrotas*, as the sun rays are the parts of sun.

#### Features of *Śiraḥ-abhighāta*

Injury to Śirah results into manyāstambha (rigidity of neck), ardita (facial paralysis), cakşuvibhrama (giddiness), tamas (darkness before eyes), udveṣṭana (squeezing pain), ceṣṭānāśa (loss of motor functions), kāsa (cough), Śvāsa (respiratory difficulty), hanugraha (rigidity of jaw), mūka (dumb), gadagada (stammering), akṣi-nimīlana (ptosis), gaṇḍa-spandana (vibration of

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cheeks), *jṛmbhaṇa* (yawning), *lālāsrāva* (salivation), *svarahāni* (loss of voice) and diseases of face and tongue.<sup>[13]</sup>

#### <u>Hrdaya</u>

#### Introduction

It is the *avayava* of *madhyaśarīra* which is also counted as *Marma*. It is organ of circulation (*rasa* and *rakta*). It has mentioned as *adhiṣṭhāna* for the *manas and buddhi*. That's why perceptibility of *manas and buddhi* comes after the manifestation of *hrdaya* during the development of *garbha*. It is a structure which resembles a *puṇḍarīkeṇa*, *kamalamukulākāraṃ* (lotus) in inverted position. When body is in active phase it expands and contracts in inactive phase.<sup>[14]</sup> It is site of *satvādi guṇa*, placed in between two breasts in the thoracic region near the opening of stomach.<sup>[15]</sup> It is responsible for conduction of *rasa*, *rakta* and *vāta*. It is site of *cetanā*, *mana*, *buddhi*, *indriya*, *pradhāna ojas*.<sup>[16]</sup> *Sādhaka pitta*, *vyāna vāyu*, *avalambaka kapha* resides in *hrdaya*.<sup>[17]</sup> *Hrdaya* is the seat for ten principle *dhamanīs*, *prāṇa*, *apāna*, *manas*, *buddhi*, *cetanā* and *mahābhūtas*, like the spokes are attached at the centre of the wheel. Hence, *hrdaya* is the centre for all of them.<sup>[18]</sup>

#### Derivation of term hrdaya

*Hrdaya* is derived from three words: *Hr: harana* means collection of *rasa rakta* from the body.  $D\bar{a}$ :  $d\bar{a}na$  means distribution or supply of *rasa rakta* to all the  $dh\bar{a}tu$  of the body. *In (ya): ayana* means expansion and contraction movements. Thus, the term *hrdaya* means structure that collects *rasa rakta* from the body, supply it to all the  $dh\bar{a}tu$  of the body and conduct expansion and contraction movements.

## Embryology

1. *hṛdaya* developed form *rakta* and *kapha*.<sup>[19]</sup>

*Rakta sāra* = is *maṃsa dhātu*. So it means to say that it is evolved from the optimum part of *rakta dhātu* and is an organ made of *māṃsapeśi* (heart is considered to be a muscular bag) *Kapha sāra* = it is meant to show its optimum work capacity.

2. *Hṛdaya* developed in fourth month in foetus. As *hṛdaya* is site of *cetanā*, it also develops in same time. <sup>[20]</sup> It is developed as *mātṛja avayava*.

#### **Position and relations**

It is considered as *raktāśaya*, present in *uraḥ* region.<sup>[21]</sup> It is related to *yakṛt*, *plīhā*, *phuphphusa* and *kloma*. *Plīhā* and *phuphphusa* are situated below and on the left side. *Yakṛt* and *kloma* are situated below and on the right side.<sup>[22]</sup>

#### Anatomical structures associated with hrdaya

It is made up of *māmsapeśī*, valves (*samvṛtāsamvṛtadvāram*,), 4chambers (*caturakṣāntaram*, *pālakāpya*). *Maņdala samdhi* present in *hṛdaya* and 24 *dhamanī* are associated with *hṛdaya*. It is *mūla* and originating point of *sirā*.

#### *Hṛdaya* as vital organ

Any traumatic injury to *hṛdaya* causes syncope, death. It is included in *daśaprāṇayatanāni*.<sup>[23]</sup> It is included in *daśa jīvita dhāmāni*. It is considered in *sadhyoprāṇahar sirā marma*, *4aṅgula* in *pramāṇa*, *āgneya guṇa* dominant, fatal within 7days. <sup>[24]</sup>

#### **Physiological Aspect**

When it is quoted by *tama* then individual leads to sleep. As the spokes of a wheel are attached to the centre, similarly the ten vessels, *prāņa vāyu*, *apāna vāyu*, *manas*, *buddhi* (wisdom), *cetanā* (consciousness) and *mahābhūta* are attached or associated to the heart.<sup>[25]</sup> *Raktavaha dhamanī* exists from *hṛdaya* whose minute branches are present all over the body. It nourishes all the *dhātu* of body by *rasa* and *rakta*. Digested food is converted into *āhārarasa*. This *āhārarasa* is responsible for strengthening heart. *Prāṇa vāyu* gets involved in strengthening heart more by way of looking after *ojas*, which is located in heart. Since heart is site of *prāṇa*, *prāṇavāyu* takes care of heart and takes care of *ojas* as well. In the context of *vega dhāraṇa*, *hṛdroga* occurs in *śramaśvāsa dhāraṇa*.

## Synonyms<sup>[26]</sup>

*Mahat* (organ that is residence of ojas), *artha* (organ which is like a summary of body), *raktāśaya* (organ where blood is present), *Raktadharā* (organ which is center of blood collection), *Mahatārtha* (organ which accomplishes an important function)

#### Functions

1. The main function of *hṛdaya* is to regulate and conduct *rasa saṃvahana*. It circulates *rasa* and *rakta* in body.

Origin of *rasavāhinī dhamanī* is *hṛdaya* and these are said as the carrier of *rasa* from *hṛdaya* to all the body parts. *Śārṅgadhara* has explained *rasavāhinī dhamanī* as having origin from *hṛdaya* or heart and is responsible for propelling *pavana* or *vāta* in whole body.

2. It is mūla of rasavaha and prāņavaha Śrotas.<sup>[27]</sup>

*Caraka* and *Suśruta* both have mentioned *hṛdaya* as *mūla* of *prāṇavaha Śrotas* because of its role in *prāṇavahana karma*. *Hṛdaya* is responsible for taking impure blood and propel it to lungs for purification (oxygenation). After receiving this oxygenated or the pure blood, heart propels it to all body tissues. *Śārṅgadhara* while explaining *śvasana kriyā* that the *pavana* named *prāṇa* goes out to take *ambarapīyūṣa* after coming in contact with *hṛdaya*. Thus role of *hṛdaya* can be understood as *mūla* of *prāṇavaha śrotas*.

- It is site of *ojas*,<sup>[28]</sup> it is attached with 10 vessels which conduct *ojas*. It is called *mahāmūla* or *mahāphalā*.
- 4. As all rivers drain their water and reach sea and ocean likewise all blood pathways drain its blood in the *hrdaya*.
- Hrdaya is able to perform its functions due to opening and closing of its valves. It is called "saspandam hrdaya".<sup>[29]</sup>
- 6. In the context of circulation of *rasa*, 24 *dhamanī* are getting into the *hrdaya*. In the context of *dhamanī* Śārīra, 10 Ūrdhvavāhī dhamanī is getting reach to the *hrdaya* and further they gets divide into 30 Ūrdhvavāhī dhamanī.

#### Features of *Hrdayābhighāta*

Injury to *hṛdaya* results into *kāsa* (cough), *Śvāsa* (respiratory problems), *balakṣaya* (weakness), *kaṇṭhaśoṣa* (weakness of neck and throat), *kloma-karśa* (emaciation of kloma), *jihvā-nirgama* (protruded tongue), *mukha-tālu-Śoṣa* (emaciation of face and palate), *apasmāra* (convulsions), *unmāda* (psychosis), *pralāpa* (delirium) and *citta-nāśa* (unconsciousness).<sup>[30]</sup>

## Vasti

## Etymology

The word *Vasti* has been derived from the root "*Vas*" after adding the suffix "*Tich*" *pratyaya*. According to *Vācaspatyam* meanings of the root '*vas*'<sup>[31]</sup>

- Vasu Nivāse- Means to reside, to stay and to dwell.
- *Vas ācchādane* Means to cover / to coat
- Vas Snehācchādana Praharaņeșu- Coating or covering of sneha for the elimination
- Basta gandha ardane- drawing of waste material in the colon from all over the body.
- *Vas vāsane surabhikarane* To produce the effect of pleasant smell.
- Baste āvrņoti mūtram- It denotes an organ, which covers the urine
- *Auşadha dānārthe dravyabhede-* It denotes an instrument used for the administration of the medicine.

## Synonyms<sup>[32]</sup>

• Mūtrāśaya, Malādhāra, Mūtradharā, Mūtrabasti, Mūtrapuṭa, Mūtrapuṭaka, Prāṇāyatanam uttamam

## Embryology

The *Basti* is a hollow structure made by the  $v\bar{a}yu$  entering in the combination of essence of *rakta* and *kapha* with the help of *pitta*.  $\bar{A}c\bar{a}rya$  *Suśruta* speaks that the hollow shape is formed when the essence part of the above three is inflated by the repeated action of  $v\bar{a}yu^{[33]}$  *Basti* is derived from  $m\bar{a}trja$   $bh\bar{a}va$ - the maternal constituents<sup>[34]</sup>

## Location

Basti has been included under the Kosthānga by all the  $\bar{a}c\bar{a}ryas$ .<sup>[35]</sup> Basti is surrounded by  $n\bar{a}bhi$ , pṛṣṭha, kati, muṣka, gudā, vankṣaṇa and Śepha.<sup>[36]</sup> Basti is surrounded by Sthūlaguda (Rectum), Muṣka (Scrotum), Sevanī (Scrotal ligament), Śukravaha nādī (Seminal ducts) and mūtravaha nādī (Ureters)<sup>[37]</sup> According to Vāgbhaṭa, the sthāna of basti is in Kaṭi Pradeśa. Ācārya Vāgbhaṭa too described the seat of basti in the pelvic cavity<sup>[38]</sup>. Ācārya Suśruta also places basti in pelvic cavity in the chapter of  $marma^{[39]}$ . Further in the chapter of  $A\acute{s}mar\bar{i}$  chikits $\bar{a}$  he states that in females the uterus is situated very near to the urinary bladder posterior position<sup>[40]</sup>

#### Structure

*Suśruta* has mentioned *basti* as one among the *Pratyangas* of the body; is *alābu* shaped (shape of a gourd) and covered by *sirā* (veins) and *snāyu* (ligaments) from all sides. The organ is extremely thin in structure (*Tanutvaka*) i.e. thin walled. This organ is provided with a single aperture or opening and lies with its mouth downward. Further the inner relation between *basti* and *basti Sira*, *Pauruşa granthi*, *vṛṣaṇa* and *gudā* is also mentioned and it is situated in the pelvic cavity.<sup>[41]</sup> The size (*pramāṇa*) of *basti marma* is equal to the pit of one's own palm.<sup>[42]</sup> According to *Vāgbhaṭa*, the shape of *basti* is *dhanurvakrā* i.e. crooked like a bow having a downward opening.<sup>[43]</sup> *Aṣṭānga Saṃgraha* explains that *basti* is composed of *rakta* and *maṃsa dhātu* and its opening is surrounded by *suṣira snāyu*<sup>[44]</sup> *Dalhaṇa* says that *basti* lacks *maṃsa* and *medadhātu*<sup>[45]</sup>

#### Importance of basti

Basti is considered as mūlasthāna of Mūtravaha Śrotas. Ācārya Suśruta has explained basti in relation with process of Urine formation to its storage.<sup>[46]</sup> He quotes giving the importance of basti as an organ where (The Soul) resides. Ācārya Caraka also quotes the importance of basti as a trimarma saying that it means that the region named basti is in the middle of sthūla guda, muşka, sevanī, the nādī (channels) transporting mūtra and Śukra. It acts as the Reservoir of mūtra. As different rivers fill the ocean in similar fashion all the ambuvaha Śrotas (channels) transporting water fill the basti.<sup>[47]</sup> Similarly in Aştānga Samgraha ācārya Vāgbhata during the description of surgical treatment of mūtra aśmarī quotes that an ill practiced surgeon would result into death of the patient undergoing the surgery by injuring the mūtravaha Śrotas – basti.<sup>[48]</sup> Vasti is related to sthūla gudā, muşka, sevanī, Śukravaha and mūtravaha nādīs, ambuvaha Śrotas, and lie in the middle of them like emissions of the sun.

#### Features of Basti-abhighāta

Injury to *vasti* results into obstruction of the flow of *vāta* (flatus), *mūtra* (urine), *varca* (faeces), pain in the groin, *mehana* (pubic region), *vasti* (bladder), *kuņḍala* (bladder abnormality), *gulma* (abdominal tumour), *anila aṣṭhīlā* (*vātaja* tumour) and many other diseases.<sup>[49]</sup>

#### Discussion

Concept of *marma* is hard to understand. Clinicians of ancient period have collected detailed information regarding injuries and their prognosis on every vital part of body and presented that theory in very summarizing form known as *marma Śārīra*. The direct understanding of word *marma* in ancient science was evident, but there were no adequate techniques to make out their original structural aspects involvement in particular *marma sthāna*. All *ācārya* have knowledge of these points on the basis of *pratyakṣa*, *anumāna* and their experiences. In *trimarmīya cikitsā adhyāya* and *trimarmīya siddhi adhyāya*, *Caraka* emphasizing the importance of these three *marmas*: *Śiraḥ*, *hṛdaya* and *vasti*.

The *trimarmas* are the center points of life. Beside  $pr\bar{a}na$  – the soul; the *trigunas* – *sattva*, *raja*, *tama* reside in them. In addition to that they are the center of *agni*, *soma*, *vāyu*. They act as *sadyahprānahara marma* and so if injured lead to death within 7days.

*Marmas* are the superficial parts as well as systemic organs. External trauma that directly injured the *marmas* in turn creates disturbance in the homeostasis of body. Internal trauma caused by the vitiated *tridoşa* generally affects *trimarma*. If any *marma* affected rigoursly, after a certain period of time *trimarma* are always affected, being seat of *doşa* and it becomes responsible of its ultimate effect, leading to interruption of function of *trimarmas*. Any disease afflicting to *prāņāyatana*, complexity of disease and prognosis in *trimarmas* is more severe than others. For these reason, *trimarma* highlighted than the others. *Caraka* said these *trimarma* as root of life. He was less concerned to the external trauma that directly injures the *marmas* but being a physician he was well concerned to the internal trauma caused by the vitiated *tridoşa* that generally affect these *trimarma*. Thus, *Caraka* limited himself to the description of the three. *Cakrapāņi* explains nothing other than these *trimarma* have capability of hosting body.

*Śiras* is an organ or structure located at the top or foremost region of the body. Thus it can be compared to head or skull. As known head is the location of brain and this is supported by its

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synonym *mastişka*. Śiras is a very important structure or part of the body as it is location of brain and other important organs like senses etc. So, if injured or diseased can create an emergency or prove fatal. The Synonyms like *uttamānga*, *āditya* directly clarify its important as *marma*. While the synonyms like *mūrdhā* glorify its action as a *marma*. It is said as an organ, injury to which leads to fainting and giddiness. When *mastişka* is used as its synonym it denotes brain and it is widely accepted as a vital spot of the body – *marma*. Hence, it may be considered as skull with brain.

*Hṛdaya marma* is explained as *sadhyoprāṇahara* and is related to *prāṇavaha srotas mūla* and *rasavaha srotas mūla sthāna*. Any trauma to heart leads to emergency and immediate death so it explains that heart is important place for *rasa rakta saṇvahana*. It is a site of *cetanā* and tripod of life. Hence, it may be considered as heart.

*Vasti* denotes an organ, which is receipted or reservoir of urine as it is basically a receipted having soft and elastic nature. In the context of marma  $\bar{a}c\bar{a}rya$  *Suśruta* has explained *vasti* as an organ comprising of little *maṃsa* and *Śoṇita*. It's situated inside the *kați* region and as a reservoir of *mūtra*. Hence, it may be considered as urinary bladder.

#### **Conclusion :**

Though classics have explained 107 *marmas* in detail, *Caraka* has emphasized and given importance to only *trimarma* in increasing order *vasti*, *hṛdaya* and *Śiraḥ* as tripod of life. They are *sadhyoprāṇahara* in nature as trauma results in immediate death of person or within period of 7days. *Sadhyoprāṇaharatva of vasti*, *hṛdaya* and *Śiraḥ* are in increasing order. External trauma injuries the *marma* and internal trauma caused by the vitiated *tridoṣa*, any disease afflicting to *prāṇāyatana*, complexity of disease and prognosis generally affects *trimarma* is more severe than others. In present scenario also, brain and heart are included in tripod of life. At the time of traumatic injuries and emergency, CPCR is recommended for basic life support in which heart and brain are resuscitated. Brain death is the confirm sign of death. For these reason, *trimarma* highlighted than the others. This article can be helpful for better understanding the concept of *trimarma* in *Ayurveda* and its importance.

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