

## An Overview of Asthi Sarata With Special Reference To Cardiopulmonary Efficiency

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### ABSTRACT:

*Ayurveda* proposes three *Doshas* (*Vata*, *Pitta* and *Kapha*), seven *Dhatus* (*Rasa*, *Rakta*, *Mamsa*, *Meda*, *Asthi*, *Majja* and *Shukra*) and three *Malas* (*Purisha*, *Mutra* and *Sweda*) as building elements of the body. The excellency or preponderance of *Dhatus*, qualitatively and quantitatively, has been described as *Sarata* of *Dhatu*. The concept of *Sarata* is greatly described by authors of ancient *Ayurveda*. The *Sarata* of all seven *Dhatus*, their physical, social and mental traits have been discussed by *Acharyas* of *Ayurveda*.

**Aims and Objectives:** The present study chiefly aims for the review of concept of *Asthi Sarata* with special reference to cardiopulmonary efficiency.

**Material and Methods:** review of concept from *Samhitas*, text books, previous works on *Asthi Sarata* with reference to cardiopulmonary efficiency in the various forms like original research articles, oral presentations, theses and other published works etc.

**Observations and Results:** The concept of *Asthi Sarata* also encompasses the concept of *Bala*. The words like “*Mahotsaha*”, “*Kriyavantah*” etc. are to be assessed with relation to physical fitness of the individual. Most of the articles have mentioned the various physical traits of *Asthi Sarata* with their association with cardio-respiratory endurance.

**Conclusion:** *Ayurveda* deals with concept of *Sarata* of *Dhatu*, amongst which *Asthi Sarata* is one of the *Sarata*. The persons showing *Asthi Sarata* have been described to have various physical, mental and social traits. The physical traits described in *Asthi Sarata* may be assessed with cardiopulmonary efficiency which represents the physical fitness of the *Asthi Sara* person.

**Key words:** *Dhatu*, *Sarata*, *Asthi Sarata*, Cardiopulmonary Efficiency

### INTRODUCTION:

*Sarata* is one of the *ayurvedic* concepts elaborated in almost all the main treatises of *Ayurveda*. The *Ayurveda* is the holistic approach of being healthy, restoring health rather than treating the illnesses and curing the diseases<sup>1</sup>. *Ayurveda* is having a basic principle of *Dosha-Dhatu-Mala* as the root of the body<sup>2</sup>. The *Doshas* (humors: *Vata*, *Pitta* and *Kapha*), *Dhatus* (body building elements: *Rasa*, *Rakta*, *Mamsa*, *Meda*, *Asthi*, *Majja* and *Shukra*) and *Mala* (excretas: *Purisha*, *Mutra* and *Sweda*) called it as *Sharira*. The *Doshas* acts in the body as subtle energies, bodily tissues are represented by *Dhatus*. *Mala* are the excretory metabolic wastes and to be excreted out of the body at proper times. The bodily tissues get nourished by diet (*Ahara*) continuously and transforms and gets matured forms of them in their locations called *Srotasa*. The development of *Dhatu* (quantitative and qualitative) is a continuous ongoing process by which the excellency of a particular *Dhatu* is achieved and prime functions of it are executed. The body tends to make the *Dhatu* preponderant and always tries to nourish all the *Dhatus*. But in this process, some *Dhatus* are nourished well and some of them are not developed upto the marks. Accordingly *Sarata* of any *Dhatu* is classified in three classes: *Pravara* (Uttama/highest quality), *Madhyama* (medium Quality) and *Avara* (Heena/ low quality)<sup>3</sup>.

The study of *Dhatus* with relation to their high or low grades of preponderance is called as *Sarata Parikshan* (*Sarata* assessment). Ancient authors of *Ayurveda* proposed the various features (traits) of all the seven *Sarata* of *Dhatus*. Ancient authors of *Ayurveda* proposed the various features (traits) of all the seven *Sarata* of *Dhatus*<sup>4</sup>.

### AIMS AND OBJECTIVES:

1. To understand and review concept of *Asthi Dhatu Sarata*.
2. To understand and review concept of *Asthi Dhatu Sarata* with special reference to Cardiopulmonary Efficiency.
3. To understand and review concept of Cardiopulmonary Efficiency.
4. To understand the concept of *Dhatu Sarata*.

## MATERIALS AND METHODS:

### 1. Materials:

Granthas like *Charak Samhita*, *Susruta Samhita*, *Ashtanga Sangraha*, *Ashtanga Hridaya*, *Sharangadhara Samhita*, *Kashyapa Samhita*, Previous works done on concepts under the study like text books, original research articles, oral presentations, theses and other published works.

Academic databases like PubMed, Scopus, Google Scholar, search engines like Google etc.

2. Methods: studying the concepts and reviewing the concepts under study.

### Brief review:

#### *Asthi Dhatu Sarata:*

The Sarata i.e. excellence and supremacy of *Asthi Dhatu* in an individual is said to be *Asthi Dhatu Sarata*.

*Acharya Charaka* has described this *Sarata* in *Vimanasthana*<sup>5</sup> *Adhyaya* 8 (Verse no. 107)

*Acharya Susruta* elaborated *Asthi Sarata* in *Sutrasthana*<sup>6</sup> *Adhyaya* 35 verse no. 18.

*Acharya Vagbhata* explained *Asthi Sarata* in *Ashtanga Hridaya Sharira Sthana Angavibhaga Sharir Adhyaya*.

*Acharya Kashyapa* described *Asthi Sara* in *Sutrasthana* 28 *Adhyaya Lakshanadhyaya*.

A comparative review from all the authors can be explained as follows:

### 1. As per *Acharya Charaka*<sup>7</sup>:

*Asthi Sara* persons are characterized by robust heavy and stout heels, ankles, knees forearms, clavicle, chin, head, joints of fingers, other bones, nails and teeth.

They are enthusiast with a great endurance, strong and have stable-firm body.

They live for longer period.

### 2. As Per *Acharya Susruta*<sup>8</sup>:

*Asthi Sara* persons have large head (skull), shoulder, strong teeth, jaws and nails.

## CARDIOPULMONARY EFFICIENCY AND ASTHI DHATU SARATA:

The *Asthi Dhatu Sarata* which is the supremacy of *Asthi Dhatu* is chiefly the appearance of characters of robusticity and heaviness of the bones and joints. Again these individual possesses the activeness and they also have a great endurance. The strength and firmness and the longevity of these persons denotes the physical fitness of them which *Ayurveda* calls *Bala*. But as per *Acharya Charaka* said, do not decide any person as strong or weak only just by looking at the built of that person. So other qualities of *Dhatu sarata* have to be assessed, in the same individual. Now consider the words used by *Acharya Charaka* like *Mahotsahah*, "*Kriyavantah*", "*Kleshasahah*", all denotes capabilities and endurance of any person.

We have some modern tools of physical fitness assessment which can help to assess these terminologies. Physical fitness tests, CPET (Cardiopulmonary exercising tests) are some of them. Simple Harvard tests can also be utilized to assess the physical fitness. Studies have also been done for assessment of relation between *Dhatu sarata* and *Dehabala* with special reference to Harvard step test<sup>9</sup>. When we consider *Dhatu sarata* in sports, the "*Samhanana*" has also to be studied. Cardiopulmonary efficiency can be assessed by observing the endurance of persons with the help of a battery of tests like Breath Holding Time, 40 mm Endurance test, Maximum Aerobic Power, Physical Fitness Index<sup>10, 11</sup> etc.

Previously PCET has been used as diagnostic tool to diagnose cardiac diseases. Nowadays CPET is proved as a valuable assessment tool for unexplained dyspnea and follow up of respiratory diseases like COPD. It is also useful to investigate exercise intolerance and levels of disabilities.

Using them with some modifications as per our requirements we can effectively assess the cardio respiratory endurance and physical fitness of the individuals with relation to studies of various *Sarata* especially *Asthi Sarata*. The assessment of cardiopulmonary efficiencies and physical fitness indices (PFI) will also help to assess "*Mahotsahah*", "*Kriyavantah*" "*Kleshasahah*" regarding *Asthi Sarata*.

## DISCUSSION AND CONCLUSION:

The qualitative and quantitative preponderance of any *Dhatu* in any human body is termed as *Sarata* of that particular *Dhatu*. The *Sarata* of any *Dhatu* as per ancient *Acharyas* of *Ayurveda*, presents some physical, mental and social traits. The *Asthi Sarata* is the supremacy and excellency of *Asthi Dhatu* in an individual. The *Asthi Dhatu* person is characterized by bony excellencies which represents bone strengths, bony dimensions, robusticity and their powers.

These persons also have good endurances and can live for longer periods. They are active and enthusiasts which represent their physical fitness.

Modern tools of assessment are available nowadays and can be applied to assess these ayurvedic parameters of *Asthi Sarata*. *Asthi Sarata* can be quantified by using battery of tests like CPET, exercising tests, VO2 Max and calculating PFIs.

Moreover no diagnostic measurable criterion is still available to quantify and assess the *Sarata* especially *Asthi Sarata*, we can try these tests of assessments and may derive a diagnostic criteria for *Asthi Sarata Parikshana*.

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