A CRITICAL LITERARY STUDY OF ASTHISANKHYA SHAREERA RELATED TO ANATOMY

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Abstract: Acharya Sushruta has elucidated that the body's organs deteriorate after death, with the exception of the bones (Asthi). The significance of Asthi and Sandhi lies in their role in supporting the human body, much like how trees rely on the central core, known as “Sara,” within their trunks. The knowledge of Asthi can be traced back through the Vedas and has been transmitted through various Samhitas over time.

Bones, which are firm connective tissues, comprise the framework of the skeletons in most vertebrates. They consist of an organic matrix rich in collagen, infused with calcium, phosphate, and other minerals. Bones serve several vital functions, including safeguarding internal organs, generating red and white blood cells, storing minerals, providing structural support, and enabling bodily movement. Understanding Shareera Sankhya (the enumeration of body parts) is crucial for distinguishing normal anatomy from abnormalities. Charaka, in his Chikitsa Sthana, elucidates the process of Asthi Dhathu formation.

Introduction:

Asthi, or bones, represent a fundamental and crucial component of the human body. In Ayurveda, the human body is understood to be composed of three primary elements: Dosa, Dhathu, and Mala. Among these, Asthidhathu is specifically associated with the structural integrity (Dharana) of the body. Due to its rigid nature, Asthidhathu plays a pivotal role in shaping the body's frame. The term “Asthi” itself is derived from "Asyathe ithi asthi," (2) suggesting that bones are a substance that does not readily decompose, unlike other parts of the body such as muscles and vessels. (3) Bones remain largely unchanged even long after death, which is why they are referred to as Asthi. Bones constitute the skeletal framework of the body and are primarily composed of calcium phosphate and calcium carbonate. The skeletal structure, which includes bones and cartilage, is what we commonly refer to as the human skeleton in anatomy. In human beings, the exoskeleton is minimal, limited to structures like nails and tooth enamel, while the primary framework is the endoskeleton. The study of the structure and function of bones and the skeletal system is known as osteology.

In the context of Ayurveda, Asthi Shareera pertains to the study of the human body’s anatomy with a specific focus on bones. Enumerating the various parts of the body is crucial for distinguishing normal anatomy from abnormalities. Charaka Samhitha's Shareera Sthana, in its 7th chapter, underscores that a physician well-versed in enumerating the body's components will exhibit clarity in medical practice. (6) Sushruta Samhita's Shareera Sthana, in its 5th chapter titled Shareera Sankhya Vyakaranu, primarily deals with the numerical aspects of the body's limbs and parts.

The Formation of Asthi Dhathu: Charakà, in his Chikitsa Sthana, elucidates the process of Asthi Dhathu formation. According to his teachings, Asthi Dhathu is derived from Medadhathu. It is a sequential transformation where Asthi Dhathu is created from Medadhathu, which is known as osteology.

Keywords: Asthi, Bones, Asthi Sankhya

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<thead>
<tr>
<th>Bones</th>
<th>Charaka</th>
<th>Vagbhatta</th>
<th>Sushruta</th>
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Table: 1
Sharangadhara provides additional insight into this process by explaining that Medo Dhatu undergoes Pakwa (maturation) through the activity of Medo Dhatwagni. Subsequently, Vayu (air) contributes to the Shoshana (drying or absorption) of this substance. This sequence ultimately results in the formation of the Sara (core essence) of the Shareera, which is the Asthi Dhatu.

In essence, these explanations from Ayurvedic texts emphasize the intricate and sequential process by which Asthi Dhatu, or bone tissue, is formed from the transformation of preceding Dhatus, involving the actions of specific metabolic factors and principles. This endeavor aims to compare the perspectives of the ancient Acharyas regarding the enumeration of bones (Asthi Sankhya Shareera) with contemporary human anatomy.

The process through which bones are formed is known as ossification or osteogenesis. It involves mesenchymal cells that differentiate into osteogenic cells, providing the structural foundation for bone formation either directly or through an intermediate stage of cartilage. Ossification is broadly categorized into two types:

1. Ossification in membrane: This is a rapid process that occurs swiftly.
2. Ossification in cartilage: This is a gradual and leisurely procedure.

The constitution of Asthi, in terms of the Panchabhoothika (five-element) composition, includes all five Mahabhoothas (fundamental elements), but it predominantly consists of Prithvi (earth) and Vayu (air) Mahabhoothas. The functions of Asthi (bone tissue) include Dehadharana (structural support), Majjapushti (nourishing the bone marrow), and providing support to the Mamsa (muscles), Sira (blood vessels), and Snayu (nerves). Bones play a vital role in holding major structures like blood vessels and nerves in their proper positions, preventing them from dislodging.

Bones serve to protect the underlying soft tissues and organs. While other attached structures may deteriorate, bones, due to their firmness, remain unchanged. Approximately 18% of the human body's weight consists of bone tissue. The skeletal system performs essential functions, including providing support, protection, facilitating movement, regulating mineral levels, producing blood cells, and storing triglycerides.

Acharya Sushruta classified bones into five types: Kapala (flat bones, such as those protecting the brain), Ruchaka (related to teeth), Taruna (soft and not dense), Valaya (curved bones), and Nalaka (long bones). These bones have specific locations in the body and serve various functions.
Asthī Sankhya, or the enumeration of bones, has been a subject of debate. According to Vedic tradition, there are believed to be 360 bones (16,17), but in Shaliya Tantra, it is counted as 300. Sushruta, however, rejects the Vedic concept of 360 bones (18).

In summary, the formation, composition, functions, types, and enumeration of bones (Asthī) are important aspects of Ayurveda and anatomy, highlighting the significance of bone tissue in maintaining the structural integrity and overall well-being of the human body.

Discussion:

The discussion revolves around the varying opinions among ancient Acharyas (teachers) regarding the number of bones in the human body and their classification. These differences stem from how different bony parts were visualized and categorized by these ancient scholars.

Acharya Sushruta's view of Asthi Sankhya (the enumeration of bones) is considered to be more precise when compared to Charaka and Vagbhatta. According to Charaka and Vagbhatta, Asthi Sankhya is 360, a count that includes nails, nail beds, Danta (teeth), and Danta Ulukhala (tooth sockets). This classification includes structures that are not considered bones in modern anatomy and significantly impacts the total count.

Sushruta's perspective on Asthi Sankhya aligns more closely with modern anatomy, which identifies 206 bones in the adult human skeleton. The discussion notes that during childhood (Balyavastha), some bones may exist in a fragmented form and fuse into a single bone during adulthood. This developmental aspect may contribute to the differences in bone enumeration.

The discussion also draws parallels between the embryological development of bones and the Acharyas' classification. For example, it's noted that the cartilaginous model of vertebrae is eventually converted into bone through ossification, which could explain why Acharyas counted certain parts as separate bones. Similar considerations are made for nasal bones and septal cartilage, as well as the sternum and its cartilaginous components.

The conclusion acknowledges the significant contributions of Ayurveda to the field of anatomy. Despite the limited resources and facilities available in ancient times, the Acharyas demonstrated advanced knowledge of anatomy. The differences in bone numbering and classification can be attributed to changes in study methodologies and documentation practices between Ayurveda and modern anatomy.

Conclusion:

Ayurveda, as presented in the ancient texts by Acharyas like Sushruta, has made substantial contributions to the field of anatomy. These texts demonstrate a thorough understanding of the human body's structure and function, including the numbering and naming of various anatomical structures.

The discussion emphasizes that despite variations in the enumeration and classification of bones by different Acharyas, their knowledge of anatomy was commendable. It also highlights how changes in methodologies and documentation practices over time have led to differences in how structures are counted and categorized. In essence, Ayurveda's ancient wisdom has played a crucial role in advancing the understanding of the human body, and its contributions to the field of anatomy remain relevant and valuable today.

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