

Mamsarajju: A Comprehensive Review of Ayurvedic and Modern Medical Perspectives

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Abstract:- *Rachana Sharir* is a branch of *Ayurveda* that focuses mainly on the embryological and structural arrangement of the human body. Within this field, *Paribhasha Sharir* plays a key role by defining specific bodily structures such as *Kandara*, *Jala*, and *Kurcha* etc using different terminology for specific structures of the body. It's important to understand these basic terminologies for the better understanding of *Ayurveda*, especially when comparing *Ayurvedic* and modern anatomical terms. This review examines the term "*Mamsarajju*," which in *Ayurveda* refers to rope-like structures associated with muscles. By analyzing *Ayurvedic* texts such as *Sushrut Sharir Sthan* and comparing them with modern anatomical references, this study establishes a correlation between "*Mamsarajju*" and the Deep back muscles of human body.

The review compares classical *Ayurvedic Samhita*, modern anatomical texts, and *Sanskrit* dictionaries to identify correlations. The analysis shows that the *Ayurvedic* concept of *Mamsarajju* aligns well with modern anatomical descriptions of specific deep back muscles like *splenius*, *Erector spinae* etc. This correlation demonstrates the accuracy of ancient *Ayurvedic* scholars and their relevance to contemporary anatomy. The interdisciplinary approach of this study not only validates *Ayurvedic* terminologies but also improves our understanding of human anatomy, contributing to both medical science and therapeutic practices.

Keywords:- *Mamsarajju*, *Paribhasha sharir*, *Ayurveda*, *Deep Back muscles*.

I. INTRODUCTION

The field of *Rachana Sharir* in *Ayurveda* delves into the embryological and structural organization of the human body. *Paribhasha Sharir*, a branch of *Rachana Sharir*, specifically defines bodily structures with different terms like *Kandara*, *Jala* etc. The term "*Paribhasha*" literally translates to "terminology". Mastery of fundamental terminologies and their core concepts is the initial step in learning any scientific discipline. While the human body's organs remain unchanged, disparities exist in the fundamental terminologies used across all sciences..^[1]

The term *Shariri* pertains to the human body. *Sushrut Sharir Sthan* provides a thorough explanation of anatomical structures, surpassing other *Samhitas*, and is considered the foremost in this aspect. For understanding human anatomy from an *Ayurvedic* viewpoint, *Sushrut Sharir Sthan* is highly recommended..^[2]

In the 5th chapter of *Sharir Sthan*, known as *Sharirsankhya Vyakaran*, various body organs like *Hridaya*, *Vrikka*, *Amashaya* etc are referred to as *Pratyanga*, are comprehensively explained with detailed divisions into different structures. *Sushruta*, in the *Sharir Samkhyavyakran Shaarir Aadhyay*, describes several terminologies such as *Kandara*, *Jala*, *Kurcha*, *Rajju*, *Sevani*, *Sanghat*, *Simant*, *Sira*, *Srotas*, etc. This in-depth exploration provides valuable insights into the understanding of human anatomy. Understanding the precise meaning of these *Ayurvedic* terms allows for comparison with modern anatomy. Therefore, in my research, I will be comparing one of these structures, called *Mamsarajju*, with modern anatomy..^[3]

This article aims to examine the controversies surrounding the alignment of ancient body structures with their modern counterparts and their clinical applications. The term "*Rajju*" refers to rope-like structures, and thus "*Mamsarajju*" denotes rope-like structures related to muscles. These structures can be correlated with the Deep back muscles such as *splenius*, *Erector spinae*, *Multifidus*, *Rotators* etc are in terms of their anatomical location and physiological function..^[4]

In the *Paribhasha Sharir*, *Acharya* identifies four anatomical structures which correspond to the modern deep muscles of the back. Deep Muscles of back include 4 layer such as superficial, intermediate, deep and deepest layer. This underscores the almost accurate correlation of the "*Mamsarajju*" terminology with these anatomical structures as described in the text. In this chapter, detailed anatomical descriptions of various *Ayurvedic* terms are provided. This allows for a comprehensive understanding of these terms and facilitates comparisons with modern anatomy.

I will be conducting a comparative analysis of a structure called *Mamsarajju* and modern anatomy in my research study. This article aims to explore controversies, draw conclusions, and discuss the relationship between the mentioned body structure and its modern counterpart, as well as its clinical applications.

II. MATERIALS AND METHODS

The *Ayurvedic Samhita*, namely the *Bruhatraayi Samhita*, is used as a reference in this review study. Several articles relating to *Paribhasha Sharir* are being investigated. Sanskrit words are deciphered using a Sanskrit dictionary. The Cunningham dissection book is being used in current anatomy. A comprehensive research and comparison of both *Ayurvedic* and modern sources is being carried out in order to uncover links between the concepts.

III. LITERATURE REVIEW

The *Mamsarajju* is the terminology which is well explained in *Sushruta Sharir Sthan* 5 th chapter and *Acharya Charak*, on the other hand, did not mention anything about *Mamsarajju*,

Rajju means Rope. Hence *Mamsarajju* means a strong rope like structure.^[5]

According to *Acharya Sushruta* *Mamsarajju* are the structures ie muscles which having the shape of rope and they are present on both side of the *Prustavamsa* (Vertebral column). It also having the functions to tie *Peshi* [Muscle] and it is total 4 in number, 2 is superficial and 2 is deep.^[6]

These are four group of muscular cords which is present on the back region and it is arranged in layers like superficial, intermediate, deep and deepest layer which is situated on either side of the vertebral column and it is having the function to maintain the vertebral column in correct posture and for the movements of the spine. These are the muscle which hold the spine in correct position and help to maintain the posture of the human body. They originate from either side of the spinal column, one pair going inwards and another going outwards.^[7]

IV. DISCUSSION

The ancient *Ayurvedic* text *Samhita* contains several terms that have not been clearly understood and linked to modern anatomy. Although our *Aacharyas* have provided detailed explanations, modern anatomical correlates are yet to be identified. This review article specifically aims to

explore and identify one of these terms known as *Mamsarajju*.

A. Modern anatomy

➤ Back Muscles

There are three major groups of back muscles:

- Superficial: attached to the shoulder girdle
- Intermediate: attached to the posterior thorax
- Deep: attached to the vertebral column, also known as the intrinsic muscle group^[8]

The superficial and intermediate muscle groups, also known as extrinsic muscles, are referred to as immigrant muscles because they are actually muscles of the upper limb that migrated to the back during fetal development..

The deep intrinsic back muscles, also known as the true back muscles, are situated deep to the extrinsic muscles and are separated from them by the thoracolumbar fascia.^[9]

According to *Ayurveda*, *Mamsarajju* can be correlated with the deep back muscles because it is situated on either side of the vertebral column, directly attached to the vertebral column, and its shape is more similar to a rope.

➤ Deep Back Muscles

The deep muscles of the back, which extend from the sacrum to the base of the skull, are well-developed and associated with controlling posture and the movements of the vertebral column. These muscles play a crucial role in maintaining posture and producing movements of the vertebral column. True muscles of the back that lie deep to the thoracolumbar fascia.^[10]

- **Superficial layer** : Splenius (splenius capitis , splenius cervicis)
- **Intermediate layer** : Erector spinae [iliocostalis, longissimus , spinalis]
- **Deep layer** : Transversospinales [semispinalis, multifidus, rotatores]
- **Deepest layer** : Segmental muscles [interspinales, intertransversarii]

Table 1 Superficial layer of Deep Back Muscle^[11]

Muscles	Origin	Insertion	Nerve supply	Actions
1.Splenius Capitis	Ligamentum nuchae. Spinous processes of seventh cervical vertebra First three or four thoracic vertebrae. (T ₁ -T ₄)	Occipital bone. Mastoid process of temporal bone	Dorsal rami of middle cervical nerves	Extension- Head and neck.
2.Splenius Cervicis	Spinous processess of third to sixth thoracic vertebrae. (T ₃ -T ₄ -T ₅ -T ₆)	Transverse processes of first two or four cervical vertebrae.(C ₁ -C ₂ or C ₁ -C ₂ -C ₃ -C ₄)	Dorsal rami of lower cervical nerves	Extends cervical region of vertebral column

Intermediate layer :[Erector spinae]This is the largest mass of the back and consist of three group of muscles.

Table 2 Intermediate Layer of Deep Back Muscle^[11]

Erectorspinae Muscles	Origin	Insertion	Nerve Supply	Actions
1.Iliocostalis [Lateral Group]				
Iliocostalis cervicis	Superior six ribs.	Transverse processes of fourth to sixth cervical vertebrae. (C ₄ -C ₅ -C ₆)	Dorsal rami of cervical nerves	Extend cervical region of vertebral column.
Iliocostalis Thoracis	Inferior six ribs	Superior six ribs.	Dorsal rami of thoracic nerves.	Maintains erect position of spine
Iliocostalis Lumborum	Inferior six ribs.	Superior six ribs.	Dorsal rami of thoracic nerves.	Maintains erect position of spine.
2.Longissimus(Intermediate group)				
Longissimus Capitis	Transverse processes of first to fourth thoracic vertebrae. (T ₁ -T ₂ -T ₃ -T ₄) Articular processes of fourth to seventh cervical vertebrae. (C ₄ -C ₅ -C ₆ -C ₇)	Mastoid process of temporal bone.	Dorsal rami of middle and lower cervical nerves.	Extension of Head
Longissimus Cervicis	Transverse processes of fourth and fifth thoracic vertebrae. (T ₄ -T ₅)	Transverse processes of second to sixth cervical vertebrae. (C ₂ -C ₃ -C ₄ -C ₅ -C ₆)	Dorsal rami of spinal nerves.	Extension-Cervical region of vertebral column
Longissimus Thoracis	Transverse processes of lumbar vertebrae.	Transverse processes of all thoracic vertebrae. (T ₁ -T ₁₂) Upper lumbar vertebrae	Dorsal rami of spinal nerves.	Extension-Thoracic region of vertebral column.
3.Spinalis [Medial group]				
Spinalis Capitis	Semispinalis capitis muscles.	Semispinalis capitis muscles.	Dorsal rami of spinal nerves.	Extension-Vertebral column.
Spinalis cervicis	Ligamentum nuchae Spinous process of seventh cervical vertebra	Spinous process of second cervical vertebra (Axis-C ₂).	- Dorsal rami of spinal nerves.	Extension-Vertebral column
Spinalis Thoracis	Spinous processes of lower thoracic vertebrae Spinous processes of upper lumbar vertebrae	-Spinous processes of upper thoracic vertebrae.	Dorsal rami of spinal nerves.	Extension-Vertebral column.

Deep layer :[Transversospinales]

Table 3 Deep layer of Deep Back Muscle^[12]

Muscle	Origin	Insertion	Nerve supply	Actions
1.Semispinalis				
Semispinalis Capitis	Articular processes of fourth, fifth and sixth cervical vertebrae (C ₄ -C ₅ -C ₆) Transverse process of seventh cervical vertebra (C ₇) Transverse processes of first six or seven thoracic vertebrae. (T ₁ -T ₂ -T ₃ -T ₄ -T ₅ -T ₆ -T ₇)	Occipital bone	Dorsal rami of cervical nerves	Extension- Vertebral column
Semispinalis cervicis	Transverse processes of upper five or six thoracic vertebrae. (T ₁ -T ₂ -T ₃ -T ₄ -T ₅ -T ₆)	Spinous processes of first to fifth cervical vertebrae. (T ₁ -T ₂ -T ₃ -T ₄ -T ₅)	Dorsal rami of cervical and thoracic spinal nerves.	Extension- Vertebral column. Rotation- Opposite side.
Semispinalis thoracis	Transverse processes of sixth to tenth thoracic vertebrae (T ₆ -T ₇ -T ₈ -T ₉ -T ₁₀)	Spinous processes of sixth and seventh cervical vertebrae. (T ₆ -T ₇) Spinous processes of upper four thoracic vertebrae. (T ₁ -T ₂ -T ₃ -T ₄)	Dorsal rami of cervical and thoracic spinal nerves.	Extension of Vertebral column
2.Multifidus	Transverse processes of lower four cervical vertebrae. (C ₄ -C ₅ -C ₆ -C ₇) Transverse processes of thoracic vertebrae. (T ₁ -T ₁₂) Transverse processes of lumbar vertebrae. (L ₁ -L ₅) Sacrum Ilium	Spinous processes of a more superior vertebrae	Dorsal rami of spinal nerves.	Extension of Vertebral column. Rotation-Opposite side
3.Rotatores	Transverse processes of all vertebrae	Spinous process of vertebra superior to the one of origin.	Dorsal rami of spinal nerves	Extension of Vertebral column. Rotation-Opposite side

Deepest layer [segmental muscles]**Table 4 Deepest layer| Segmental layer |of Deep Back Muscle^[12]**

Muscle	Origin	Insertion	Nerve supply	Actions
1.Inerspinalis	Superior surface of all spinous processes.	Inferior surface of spinous processes of vertebrae superior to the one of origin.	Dorsal rami of spinal nerves	Extension- Vertebral column
2.Intertransversarii	Transverse processes of all vertebrae	Transverse processes of vertebrae superior to the one of origin	Dorsal and ventral rami of spinal nerves	Lateral flexes vertebral column

V. CONCLUSION

This comprehensive review highlights the significant correlations between the *Ayurvedic* term "*Mamsarajju*" and the deep back muscles in modern anatomy. By meticulously analyzing classical *Ayurvedic* texts, such as *Sushrut Sharir Sthana*, and comparing them with contemporary anatomical references, we have established that the ancient descriptions of "*Mamsarajju*" align closely with the structure and function of deep back muscles, including the splenius, erector spinae, multifidus, and rotatores. This interdisciplinary approach not only validates the accuracy of *Ayurvedic* scholars in their anatomical descriptions but also underscores the relevance and applicability of ancient medical wisdom in contemporary medical science. By bridging the gap between *Ayurveda* and modern anatomy, this study enhances our understanding of human anatomy and opens avenues for integrated therapeutic practices, thereby contributing to the advancement of medical science and holistic health care.

Through detailed analysis and comparison of classical *Ayurvedic* texts and modern anatomical references, it is evident that many *Ayurvedic* terms have direct counterparts in modern science. This not only validates the precision of ancient *Ayurvedic* scholars but also enriches our understanding of human anatomy by integrating traditional and modern perspectives. As demonstrated, the *Mamsarajju* terminology aligns well with deep back muscles, thereby affirming the value of in contributing to our comprehensive knowledge of human anatomy and its clinical applications. This interdisciplinary approach fosters a holistic understanding of the body, which is crucial for advancing both medical science and therapeutic practices.

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