

"Understanding the Need: Impact of Poor Posture on the Structure of *Greeva* (Cervical Vertebrae) – An Integrative Review

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ABSTRACT

Sedentary lifestyles and prolonged digital device use have led to a widespread rise in poor posture, particularly affecting the cervical spine (*Greeva*). This results in structural alterations, manifesting as pain, stiffness, and neurological deficits. Both *Ayurveda* and modern medical science recognize the significance of postural integrity for cervical health. *Ayurveda* attributes these changes to *Vata Dosha* vitiation affecting *Asthi Dhatu*, while contemporary science emphasizes biomechanical strain and degenerative processes. This integrative review highlights the importance of early diagnosis, postural awareness, and a combined therapeutic approach for effective prevention and management of posture-induced cervical disorders.

Keywords: *Greeva*, *Vata Dosha*, *Asthi Dhatu*, Poor Posture

INTRODUCTION

"*Greeva* is described as the structure responsible for the *Dharan* (support) of *Shira* (head)." Structurally and functionally intricate, *Greeva* is a vital region of the body. The cervical spine, consisting of seven vertebrae, enables head movement and houses the upper spinal cord. However, modern lifestyle habits such as prolonged sitting, improper ergonomics, and habitual forward head posture contribute significantly to cervical strain. These factors often lead to loss of cervical lordosis, disc compression, and nerve impingement, resulting in pain, stiffness, and neurological symptoms.

Ayurveda, the ancient Indian science of life, acknowledges *Greeva* as a key region governed by *Vata Dosha*. Imbalanced posture (*Mithya Vihara*) is understood to aggravate *Vata*, leading to dysfunction of *Asthi* (bones) and *Sandhi* (joints). These concepts align with modern biomechanical explanations of postural degeneration. A comprehensive understanding integrating both *Ayurvedic* and modern anatomical perspectives is essential for effective prevention, diagnosis, and management of posture-related cervical conditions.

GREEVA SHARIR

In *Ayurvedic* literature, *Greeva* is considered a part of *Madhyama Sharira* (central body region) and is structurally supported by *Mamsa* (muscles), *Asthi* (bones), *Sira* (blood vessels), and *Snayu* (ligaments).^[1] Acharya Charaka describes the *Greeva* as consisting of fifteen bones, whereas Acharya Sushruta mentions nine bones in this region.^{[2][3]}

Involvement of *Doshas*:

The cervical region is predominantly influenced by *Vata Dosha*, which governs movement, stability, and neural control. Improper posture (*Mithya Vihara*) can aggravate *Vata*, resulting in *Greeva Shoola* (neck pain), *Sthambha* (stiffness), and *Greeva Sthana Vikriti*. Among the 80 types of *Vata Rogas*, *Shoola* and *Stambha* are the most commonly observed features. These two symptoms define *Greeva Stambha*, which is described as a *Shuddha Vataja Roga*. While *Shoola* often manifests in the early stage, *Stambha* may be associated with *Bheda Avastha* (later stages) of the disorder. Conditions such as *Sandhigata Vata*, *Manya Stambha*, *Greeva Hundanam*, *Greeva Stambha*, *Antar Ayama*, *Bahir Ayama*, *Ardhavabhedaka*, and *Vishwachi* are described under *Lakshana Pradhanta* as disorders presenting with *Greevashoola*^[4].

Chronic *Vata* aggravation leads to *Dhatukshaya*, especially of *Asthi* and *Majja Dhātu*, which may present as degenerative spinal changes. Additionally, prolonged postural strain may disturb *Vyana Vayu* and *Udana Vayu*, contributing to neurological symptoms such as dizziness, tingling, or numbness.

CERVICAL VERTEBRAE

The cervical spine is a complex anatomical structure that provides both flexibility and stability to the upper body. It houses the spinal cord, which transmits neural signals between the brain and the rest of the body. The cervical region plays a crucial role in maintaining posture, balance, and coordinated movement. Structurally, it comprises seven vertebrae (C1–C7), intervertebral discs, muscles, and ligaments, facilitating a wide range of movements including flexion, extension, rotation, and lateral bending. [5]

A healthy cervical spine maintains a gentle lordotic curve, extending posteriorly from the base of the skull into the thoracic region. This curvature is essential for load distribution and spinal alignment. However, poor postural habits can alter this curvature, especially diminishing cervical lordosis, which may contribute to spinal strain and dysfunction.

Postural alignment refers to a state of musculoskeletal equilibrium that minimizes stress on supportive structures. [6]

Deviations from this alignment - such as forward head posture or rounded shoulders can increase mechanical pressure on cervical muscles and ligaments, leading to fatigue, discomfort, and structural instability over time. [7]

POOR POSTURE

Forward head posture significantly alters the biomechanical load on the cervical spine. Even a slight anterior shift of the head increases gravitational strain, placing excessive pressure on cervical vertebrae and associated musculature. This imbalance results in hyperextension of the upper cervical segments and hyperflexion of the lower segments, forcing the cervical vertebrae to tilt excessively forward. Over time, these mechanical stresses may contribute to degenerative changes, muscular fatigue, and postural instability.

Contributing Factors

Several everyday habits contribute to the development of poor posture and associated cervical discomfort:

1. **Sedentary Lifestyle** – Prolonged sitting reduces muscular engagement and leads to weakening of postural support structures. [8]
2. **Poor Ergonomics** – An improperly arranged workstation (e.g., screen height, chair angle) exerts abnormal stress on the cervical spine. [9]
3. **Excessive Mobile/Screen Use** – Sustained forward head position, commonly referred to as “text neck,” increases cervical strain. [10]
4. **Lack of Exercise** – Inadequate strengthening of core and neck musculature diminishes spinal stability. [11]
5. **Improper Sleeping Posture** – Use of overly high pillows or prone sleeping positions may misalign the cervical region. [12]
6. **Psychological Stress** – Chronic stress and anxiety often result in involuntary muscular tension in the neck and shoulder girdle. [13]
7. **History of Trauma** – Previous cervical injuries can lead to compensatory muscular adaptations and persistent postural deviations. [14]

EFFECTS OF POOR POSTURE

Sustained poor posture can result in a range of physiological and structural complications, including:

1. **Muscle Strain and Pain** – Excessive load on neck, shoulder, and upper back muscles often leads to chronic discomfort and myofascial tension. [15]

2. **Spinal Degeneration** – Prolonged mechanical stress may accelerate intervertebral disc wear and contribute to early-onset cervical osteoarthritis. ^[16]
3. **Reduced Respiratory Efficiency** – Anterior head positioning can limit thoracic expansion, decreasing lung capacity and diaphragmatic movement. ^[17]
4. **Impaired Balance** – Postural misalignment affects proprioceptive feedback and compromises physical stability. ^[18]
5. **Mental Fatigue** – Persistent musculoskeletal discomfort may reduce concentration, increase irritability, and impact mood regulation. ^[19]
6. **Headaches and Eye Strain** – Tension in cervical muscles often results in cervicogenic or tension-type headaches, occasionally accompanied by visual fatigue. ^[20]
7. **Spinal Curvature Alterations** – Loss or reversal of cervical lordosis disrupts biomechanical harmony and increases spinal vulnerability. ^[21]

Radiological Findings:

Imaging techniques often show narrowed disc spaces, bony projections, abnormal curvature, and alignment issues.

POSTURE CORRECTION APPROACHES

Effective correction of poor posture and prevention of structural degeneration in the cervical region necessitate a comprehensive strategy. This includes ergonomic improvements, physical rehabilitation, lifestyle changes, and integrative therapies drawn from both *Ayurvedic* and modern medical systems.

1. Ergonomic Adjustments

Proper workstation ergonomics are crucial to minimizing strain on the cervical spine. Optimizing chair height, monitor level, and keyboard placement helps maintain neutral spinal alignment. Avoiding forward head posture during prolonged mobile or computer use is essential to prevent cumulative mechanical stress. ^[22]

2. Therapeutic Exercises

Targeted physical exercises strengthen the neck, shoulder, and core musculature, which enhances postural support and reduces muscular imbalance. Regular stretching routines improve spinal flexibility and help alleviate stiffness associated with sedentary behavior. ^[23]

3. Lifestyle Modifications

Simple habits such as taking micro-breaks during extended sitting, incorporating *yoga* and meditation for stress reduction, and maintaining optimal body weight play a key role in preserving postural health and preventing cervical strain. ^[24]

4. Modern Clinical Interventions

In more advanced or symptomatic cases, interventions such as physiotherapy, chiropractic care, and the use of supportive devices like cervical collars may be recommended. These methods aim to restore spinal alignment, reduce pain, and improve neuromuscular function. ^[25]

5. *Ayurvedic* Concepts and Therapeutic Approaches for Cervical Disorders ^[26]

Although diagnostic frameworks differ, the *Ayurvedic* understanding of *Greeva* aligns well with many anatomical and functional aspects described in modern anatomy. *Ayurveda* emphasizes *Dosha* balance (*Vata*, *Pitta*, *Kapha*) and improved neuromuscular coordination using holistic therapies such as *Abhyanga* (therapeutic massage with medicated oils), *Basti* (enema therapy), and *Nasya* (nasal therapy).

- **Vata Disorders:** Pain, stiffness, and restricted mobility in *Greeva* due to *Vata* vitiation resemble clinical features of cervical spondylosis and radiculopathy. Management includes *Snehana* (oleation) and *Swedana* (sudation) to relieve *Vata*-related symptoms.

- **Kapha Disorders:** *Kapha* imbalance often presents as heaviness and rigidity in the cervical region. Treatments aim to mobilize *Kapha* and restore flexibility using heat therapies and stimulating herbal preparations.

• Key *Ayurvedic* Therapies:

- ***Greeva Basti***: A localized treatment in which warm medicated oil is retained over the neck within a dough dam to reduce stiffness, inflammation, and pain.
- ***Nasya Karma***: Administration of herbal oils or powders through the nasal route to treat disorders of the head and neck.
- ***Yoga and Pranayama***: Practices such as *Bhujangasana* (cobra pose) and *Ujjayi Pranayama* enhance cervical mobility and regulate *Vata* and *Kapha* balance.

DISCUSSION

The rising prevalence of postural disorders, particularly those involving the cervical vertebrae (*Greeva*), highlights the importance of understanding both causative factors and holistic strategies for intervention. From a modern anatomical perspective, prolonged forward head posture, poor ergonomics, and sedentary behavior contribute to biomechanical overload, muscular fatigue, and degenerative changes such as intervertebral disc wear and nerve root compression. These outcomes are well documented through imaging modalities like MRI and supported by clinical assessments.

In *Ayurvedic* literature, such disorders are attributed to *Vata Dosha* vitiation, particularly affecting *Asthi* and *Majja Dhatus*. Classical texts describe *Greeva Stambha* as a *Vataja Roga*, marked by *Shoola* (pain), *Stambha* (stiffness), and *Hina Cheshta* (restricted mobility). Contributing factors such as faulty *Dinacharya* (daily regimen), *Avyayama* (lack of exercise), and *Mithya Vihara* (inappropriate behavior or activity) are considered key in the pathogenesis of cervical disorders.

An integrative model combining *Ayurvedic* and modern approaches provides a more comprehensive framework for prevention and management. While modern therapy emphasizes biomechanical correction through physiotherapy, ergonomic design, and exercise, *Ayurveda* offers *Dosha*-specific treatments, local therapies (e.g., *Abhyanga*, *Nasya*, *Greeva Basti*), and personalized lifestyle guidance. This synergy enhances therapeutic outcomes and minimizes recurrence.

Importantly, the goal extends beyond symptomatic relief to early awareness and prevention of irreversible structural degeneration. Public education on posture, *Prakriti*-specific care, and preventive practices rooted in classical and modern knowledge is essential. Further clinical research comparing integrative vs. conventional approaches, as well as patient-specific outcomes based on *Prakriti* or postural type, could support broader application in evidence-based practice.

CONCLUSION

Uncorrected poor postural habits can lead to progressive structural changes in the cervical vertebrae, contributing to chronic pain, stiffness, and neurovascular complications, ultimately impairing quality of life. Modern science attributes these outcomes to biomechanical stress and degenerative changes, while *Ayurveda* views them as manifestations of *Vata Dosha* imbalance, resulting in *Greeva Vikriti*.

This integrative review demonstrates that early recognition, preventive strategies, and individualized care drawn from both systems can effectively address cervical dysfunction at its initial stages. Encouraging posture education, incorporating *Ayurvedic* daily regimens (*Dinacharya*), and utilizing modern rehabilitative techniques such as physiotherapy offer a comprehensive management strategy.

Further research into integrative protocols and their clinical outcomes may support broader adoption in evidence-based practice. Additionally, public health efforts to raise awareness about posture and lifestyle could contribute significantly to long-term spinal health.

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