

GREEVASTAMBHA (CERVICAL SPONDYLOSIS): AN INTEGRATIVE REVIEW OF STRUCTURAL CHANGES, CLINICAL FEATURES, AND AYURVEDIC PERSPECTIVES

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ABSTRACT

Background: Cervical spondylosis is one of the most common degenerative disorders affecting the cervical spine and is frequently associated with chronic neck pain, stiffness, and neurological manifestations. **Objective:** To review the structural, pathological, and clinical aspects of cervical spondylosis and correlate them with the *Ayurvedic* concept of *Greevastambha*. **Materials and Methods:** Classical *Ayurvedic* texts, including *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, and modern medical textbooks and peer-reviewed articles, were reviewed to understand the pathology, biomechanics, clinical manifestations, and management approaches related to cervical spondylosis. **Results:** The findings indicate that cervical spondylosis involves progressive degeneration of intervertebral discs and vertebral structures, leading to pain, stiffness, radiculopathy, and myelopathy.

Ayurvedic concepts such as *Greevastambha* and *Asthigata Vata* closely resemble the disease pathology described in modern medicine. **Conclusion:** Cervical spondylosis is a common degenerative disorder of the cervical spine characterized by disc degeneration, osteophyte

formation, and neck pain. Sedentary lifestyle, poor posture, and prolonged computer or mobile use contribute significantly to its prevalence. Clinical features include neck stiffness, headache, vertigo, paraesthesia, radiculopathy, and myelopathy. In *Ayurveda*, the condition resembles *Greevastambha*, *Manyastambha*, and *Asthigata Vata*, where aggravated *Vata Dosha* and degeneration of *Asthi Dhatu* are considered the main pathological factors. This review correlates modern and *Ayurvedic* perspectives to provide an integrative understanding for better prevention and management of cervical spondylosis.

KEYWORDS: Cervical spondylosis, *Greevastambha*, *Asthigata Vata*, Neck pain, Cervical spine.

INTRODUCTION

Ayurveda is a holistic system of medicine that emphasises the preservation of health and prevention of disease. The term *Ayurveda* is derived from the *Sanskrit* words *Ayush* (life) and *Veda* (knowledge). The primary aim of *Ayurveda* is to promote physical, mental, and social well-being, thereby enabling individuals to achieve the four *Purusharthas*—*Dharma*, *Artha*, *Kama*, and *Moksha*.

Modern lifestyle changes, including prolonged desk work, excessive use of computers and mobile devices, psychological stress, and improper posture, have contributed significantly to musculoskeletal disorders. Among these disorders, cervical spondylosis is highly prevalent and is considered a major cause of chronic neck pain and disability.

Cervical spondylosis refers to degenerative changes affecting the cervical vertebrae, intervertebral discs, facet joints, and associated ligaments. Disc dehydration, reduction in disc height, and osteophyte formation may result in narrowing of the spinal canal and neural foramina, causing radiculopathy or myelopathy.

Although *Ayurveda* does not specifically mention cervical spondylosis as a distinct clinical entity, the condition can be correlated with *Greevastambha*, *Manyastambha*, and *Asthigata Vata*. Degenerative changes involving bone tissue, along with aggravated *Vata Dosha*, form the fundamental basis of disease pathogenesis. Among these conditions, *Greevastambha* is characterised by stiffness and restricted movement of the neck, closely resembling cervical spondylosis.

The increasing prevalence of cervical degenerative disorders necessitates an integrative

understanding of their anatomical, pathological, and clinical aspects from both *Ayurvedic* and modern medical perspectives.

AIM AND OBJECTIVES

1. To study the anatomy and biomechanics of the cervical vertebral column.
2. To review the pathological changes associated with cervical spondylosis.
3. To correlate cervical spondylosis with the *Ayurvedic* concept of *Greevastambha*.
4. To analyze modern and *Ayurvedic* approaches for the management of cervical degenerative disorders.

MATERIALS AND METHODS

The present review was conducted using classical *Ayurvedic* texts, including *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Ashtanga Sangraha*, *Bhavaprakasha*, and *Sharangadhara Samhita*. Modern references included standard medical textbooks such as Davidson's Principles and Practice of Medicine, Current Medical Diagnosis and Treatment, and Harrison's Principles of Internal Medicine. Relevant journal articles and published literature were also reviewed to establish correlations between *Ayurvedic* concepts and modern pathological understanding.

ANATOMY AND BIOMECHANICS OF THE CERVICAL SPINE

The cervical spine consists of seven vertebrae (C1–C7) that support the head and permit a wide range of movements, including flexion, extension, lateral bending, and rotation. The atlas (C1) and axis (C2) are structurally specialized to facilitate head movement. Intervertebral discs, uncovertebral joints, facet joints, ligaments, and paraspinal muscles contribute to spinal stability and mobility.

The cervical spine bears significant biomechanical stress because of its mobility and continuous support of the head. The lower cervical segments, especially C5–C6 and C6–C7, are more susceptible to degenerative changes due to repetitive motion and increased mechanical load.

Intervertebral discs function as shock absorbers and distribute mechanical forces evenly between vertebrae. Degeneration of these discs alters spinal biomechanics, resulting in instability, abnormal motion, and increased stress on adjacent structures.

CERVICAL SPONDYLOSIS

Cervical spondylosis is a degenerative condition involving intervertebral discs and facet joints of the cervical spine. Degeneration results in thinning of articular cartilage, subchondral sclerosis, osteophyte formation, and narrowing of intervertebral spaces.

The commonly affected vertebral levels are C5–C6 and C6–C7 due to increased biomechanical stress. Osteophytic encroachment into the spinal canal or neural foramina may compress nerve roots or the spinal cord, leading to neurological deficits.

Clinical manifestations commonly include

- Neck pain and stiffness
- Restricted cervical movements
- Headache
- Vertigo
- Paraesthesia
- Radicular pain radiating to upper limbs
- Cervical myelopathy in advanced cases

Patients with cervical myelopathy may present with gait disturbances, hand clumsiness, exaggerated reflexes, sensory deficits, and bladder dysfunction.

NECK PAIN AND DISC PATHOLOGY

Neck pain may arise from congenital abnormalities, trauma, infection, neoplasms, inflammatory disorders, or degenerative conditions.

Acute cervical disc prolapse commonly produces neck pain radiating to the upper limb. Depending upon the level of disc involvement, neurological deficits involving C6 or C7 nerve roots may occur. Clinical features include sensory disturbances, muscle weakness, diminished reflexes, and aggravation of pain during coughing or neck movements.

Chronic degeneration may eventually lead to rupture or herniation of cervical discs, resulting in spinal cord compression and cervical myelopathy.

AYURVEDIC PERSPECTIVE OF GREEVASTAMBHA

In *Ayurveda*, *Greevastambha* is described among the *Vata Nanatmaja Vikara* by *Acharya Charaka*. The term is composed of two words: *Greeva* (neck) and *Stambha* (stiffness).

The disease is primarily caused by aggravation of *Vata Dosha* due to:

- Improper posture
- Excessive physical strain
- Trauma
- Irregular dietary habits
- Suppression of natural urges
- Aging and tissue degeneration

The pathological process mainly involves degeneration of *Asthi Dhātu* and disturbance of *Vata Dosha*, producing pain, stiffness, and restriction of neck movement. Hence, cervical spondylosis may also be considered under *Asthigata Vata*.

The concept of *Dhātu Kshaya* (tissue depletion) is highly relevant in understanding cervical spondylosis. With advancing age, there is progressive depletion of body tissues, especially *Asthi Dhātu*, resulting in weakness of vertebral structures and degeneration of joints. The predominance of *Vata Dosha* during old age further accelerates degenerative processes.

PATHOPHYSIOLOGY OF CERVICAL SPONDYLOSIS

Degeneration of the cervical spine begins with biochemical and structural changes within the intervertebral discs. With advancing age, there is a gradual dehydration of the nucleus pulposus due to a reduction in proteoglycan content. Loss of disc hydration decreases elasticity and shock-absorbing capacity, leading to annular fissures and collapse of disc spaces. These changes alter cervical biomechanics and increase stress on vertebral end plates and facet joints.

Progressive degeneration stimulates osteophyte formation around vertebral margins as a compensatory mechanism to stabilize the spine. Hypertrophy of ligamentum flavum and uncovertebral joints may further contribute to narrowing of the spinal canal and intervertebral foramina. Compression of spinal nerves results in radiculopathy, while spinal cord compression leads to cervical myelopathy.

Inflammatory mediators released during degeneration may also contribute to pain generation and neural irritation. Chronic compression compromises vascular supply to neural tissues, resulting in ischemic changes and neurological deficits.

CLINICAL FEATURES

The clinical manifestations of cervical spondylosis vary according to the severity and structures involved. Common symptoms include:

- Chronic neck pain
- Neck stiffness
- Restricted cervical movements
- Occipital headache
- Shoulder and arm pain
- Vertigo and dizziness
- Tingling and numbness in the upper limbs
- Muscle weakness
- Difficulty in hand coordination
- Gait disturbances in advanced myelopathy

Clinical examination may reveal tenderness over cervical vertebrae, reduced range of motion, muscle spasm, diminished reflexes, sensory deficits, and signs of upper motor neuron lesions in cases of spinal cord involvement.

DIAGNOSTIC EVALUATION

Diagnosis of cervical spondylosis is primarily based on clinical history, physical examination, and radiological investigations.

RADIOLOGICAL INVESTIGATIONS X-RAY CERVICAL SPINE

Plain radiographs may reveal:

- Reduction in intervertebral disc space
- Osteophyte formation
- Vertebral sclerosis
- Cervical lordosis abnormalities

MAGNETIC RESONANCE IMAGING (MRI)

MRI is considered the gold standard for evaluation of cervical disc degeneration, spinal canal stenosis, nerve root compression, and cervical myelopathy.

COMPUTED TOMOGRAPHY (CT)

A CT scan provides a detailed assessment of bony structures and osteophytic changes.

ELECTROPHYSIOLOGICAL STUDIES

Nerve conduction studies and electromyography may assist in differentiating cervical radiculopathy from peripheral neuropathies.

AYURVEDIC SAMPRAPTI (PATHOGENESIS)

According to *Ayurveda*, improper dietary habits, excessive physical strain, trauma, ageing, suppression of natural urges, and faulty posture aggravate *Vata Dosha*. Aggravated *Vata* localises in the *Greeva Pradesh* (cervical region) and produces degeneration of *Asthi Dhatu* and associated *Sandhi* (joints).

The *Samprapti Ghataka* of *Greevastambha* can be summarized as follows

- *Dosha: Vata predominant*
- *Dushya: Asthi, Majja, Snayu*
- *Agni: Vishamagni*
- *Srotas: Asthivaha and Majjavaha Srotas*
- *Udbhava Sthana: Pakwashaya*
- *Adhisthana: Greeva Pradesh*
- *Rogamarga: Madhyama Rogamarga*

The disease process ultimately results in pain (*Shoola*), stiffness (*Stambha*), restricted movements, and neurological manifestations.

PRINCIPLES OF MANAGEMENT

Management of cervical spondylosis involves both preventive and therapeutic measures.

MODERN MANAGEMENT

Conservative management includes:

- Rest and posture correction
- Cervical collar immobilization
- Physiotherapy and strengthening exercises
- Analgesics and NSAIDs
- Muscle relaxants
- Cervical traction

Surgical intervention is indicated in severe cases with progressive neurological deficits, spinal instability, or refractory myelopathy.

AYURVEDIC MANAGEMENT

Ayurvedic treatment aims at the pacification of *Vata Dosha*, nourishment of *Asthi Dhātu*, and restoration of normal neck function.

PANCHAKARMA PROCEDURES

- *Snehana*
- *Swedana*
- *Basti Karma*
- *Nasya Karma*
- *Greeva Basti*
- *Patra Pinda Sweda*

SHAMANA THERAPY

Commonly used formulations include:

- *Yogaraja Guggulu*
- *Mahayogaraja Guggulu*
- *Dashamoola Kwatha*
- *Rasna Saptaka Kwatha*
- *Ashwagandha preparations*

LIFESTYLE MODIFICATION

- Ergonomic correction
- Regular neck exercises
- Yoga and meditation
- Proper sleeping posture
- Avoidance of prolonged computer and mobile usage

PREVENTIVE MEASURES

Prevention of cervical spondylosis is essential in modern sedentary populations. Important preventive strategies include:

- Maintaining correct posture during work
- Avoiding prolonged flexion of the neck
- Regular stretching and strengthening exercises
- Use of ergonomically designed workstations
- Stress reduction techniques

- Adequate nutrition for bone health
- Early treatment of neck strain and musculoskeletal disorders

DISCUSSION

Cervical spondylosis is a progressive degenerative disorder involving the cervical vertebrae, intervertebral discs, uncovertebral joints, ligaments, and facet joints. It is considered one of the most common age-related disorders of the spine and is frequently associated with chronic neck pain and neurological complications. Degenerative changes begin with dehydration and biochemical alterations of the intervertebral discs, leading to a reduction in disc height and loss of elasticity. These alterations increase biomechanical stress on adjacent vertebral structures, ultimately resulting in osteophyte formation, ligamentous thickening, and narrowing of neural foramina and the spinal canal.

The cervical spine bears substantial mechanical stress because of its high mobility and role in supporting the head. The lower cervical segments, particularly C5–C6 and C6–C7, are more prone to degeneration due to repetitive motion and increased load-bearing activity.^[9] Degeneration of intervertebral discs alters normal spinal biomechanics, producing instability and abnormal motion between vertebrae. Osteophytes develop as compensatory changes aimed at stabilizing the spine; however, these secondary changes often contribute to neural compression and chronic pain syndromes.

Clinical manifestations of cervical spondylosis vary depending on the structures involved. Mechanical neck pain is the most common presentation and is frequently aggravated by prolonged sitting, improper posture, or repetitive movements. Radiculopathy develops due to compression of cervical nerve roots and presents with radiating pain, numbness, paraesthesia, and weakness in the upper limbs. In advanced stages, cervical myelopathy may occur because of spinal cord compression. Patients may develop gait instability, exaggerated reflexes, hand clumsiness, bladder dysfunction, and sensory deficits.

Modern lifestyle factors play a major role in accelerating degenerative changes. Prolonged computer use, excessive smartphone usage, sedentary behaviour, occupational strain, inadequate ergonomics, and psychological stress contribute significantly to cervical spine disorders. Improper sitting posture causes sustained strain on cervical musculature and ligaments, leading to repetitive microtrauma and early degeneration. Additionally, obesity, smoking, and lack of physical activity have been identified as important risk factors associated

with progression of degenerative spinal disorders.

From the *Ayurvedic* perspective, cervical spondylosis can be correlated with *Greevastambha*, *Manyastambha*, and *Asthigata Vata*. *Vata Dosha* is the principal factor responsible for degeneration, pain, stiffness, and restriction of movement. Classical *Ayurvedic* texts describe that aggravation of *Vata* due to excessive physical activity, improper posture, irregular diet, suppression of natural urges, trauma, and aging leads to degeneration of *Asthi Dhātu* and associated structures.

Ayurvedic management emphasizes correction of aggravated *Vata Dosha*, nourishment of degenerated tissues, and restoration of cervical mobility. Therapeutic approaches include:

- *Snehana* (oleation therapy)
- *Swedana* (sudation therapy)
- *Basti Karma* (medicated enema therapy)
- *Nasya Karma*
- Local procedures such as *Greeva Basti* and *Patra Pinda Sweda*

These therapies improve circulation, reduce stiffness, alleviate pain, and support tissue regeneration.

Contemporary management strategies include conservative treatment with analgesics, non-steroidal anti-inflammatory drugs, muscle relaxants, physiotherapy, cervical traction, and lifestyle modification. Surgical intervention is reserved for patients with severe neurological deficits, spinal instability, or refractory myelopathy.

Recent evidence suggests that integrative management combining *Ayurvedic* therapies with physiotherapy and ergonomic correction may provide long-term symptomatic relief and improved quality of life. Preventive strategies such as posture correction, regular exercise, ergonomic workstations, yoga, and stress management are crucial in reducing disease burden.

CONCLUSION

Cervical spondylosis is a multifactorial degenerative disorder resulting from progressive structural and biomechanical alterations in the cervical spine. Age-related degeneration of intervertebral discs, osteophyte formation, ligamentous hypertrophy, and spinal canal narrowing collectively contribute to pain, stiffness, radiculopathy, and myelopathy. The condition has become increasingly prevalent due to sedentary lifestyles, occupational stress,

prolonged screen exposure, and poor postural habits.

Ayurveda provides a comprehensive understanding of this condition through the concepts of *Greevastambha* and *Asthigata Vata*. Degeneration of *Asthi Dhatu*, along with aggravation of *Vata Dosha*, forms the central pathological mechanism. *Ayurvedic* principles emphasise not only symptomatic management but also the restoration of tissue balance, the prevention of degeneration, and the improvement of quality of life.

An integrative approach combining modern diagnostic techniques, physiotherapy, ergonomic correction, *Panchakarma* therapies, and lifestyle modifications may offer better therapeutic outcomes than isolated treatment modalities. Early diagnosis, preventive strategies, and multidisciplinary management are essential to reduce disability and improve functional capacity in patients suffering from cervical spondylosis.

Further clinical and experimental studies are required to scientifically validate *Ayurvedic* interventions and establish evidence-based integrative treatment protocols for degenerative cervical spine disorders.

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AUTHOR CONTRIBUTIONS

Dr. Surendra Kumar contributed to conceptualization, literature review, manuscript drafting, and compilation of *Ayurvedic* references. Dr. Ajay Kumar contributed to the analysis of modern medical literature, interpretation of clinical aspects, and manuscript editing. Dr. Priyanka supervised the study design, critically reviewed the manuscript, and contributed to final manuscript preparation.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this article.

ETHICAL CONSIDERATION

As this is a review article based entirely on classical *Ayurvedic* literature, published textbooks, and previously published scientific studies, ethical committee approval was not required.

FUTURE SCOPE

Further interdisciplinary clinical studies integrating *Ayurvedic* management protocols with contemporary rehabilitation and physiotherapy approaches are required to establish evidence-based treatment strategies for cervical spondylosis. Advanced radiological evaluation and long-term follow-up studies may help assess the efficacy of *Panchakarma* procedures and *Ayurvedic* interventions in degenerative cervical disorders.

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