

Cervical Spondylosis: A Comprehensive Review of Recent Epidemiology, Risk Factors, and Management Strategies in digital era

Prof (Dr)Vishesh Singhal, Dr. Sumedha bhatia

Saraswati College of Physiotherapy, India

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Abstract: Cervical spondylosis (CS) is a degenerative disorder affecting the cervical spine, with increasing prevalence globally due to sedentary lifestyles and prolonged screen exposure. This review synthesizes findings from recent literature (primarily the last five years) on the epidemiology, risk factors, diagnosis, and management of CS. A significant rise in neck pain among young adults and students, especially due to poor posture and excessive digital device use, has been documented.[1-4] Various psychosocial, ergonomic, and demographic factors contribute to CS.[5-8] Diagnostic advances and a multidisciplinary approach incorporating physical therapy, ergonomics, and surgical interventions have shown promising outcomes.[9-12] Public health strategies focusing on education, early intervention, and workplace ergonomics are critical to mitigating the burden of CS.[6,11]

Keywords: Cervical spondylosis, neck pain, posture, digital device use, ergonomics, physiotherapy, risk factors, young adults

I. Introduction

Cervical spondylosis (CS), a degenerative condition of the cervical spine, represents a common musculoskeletal disorder characterized by disc degeneration, osteophyte formation, and vertebral changes.[9,13] Traditionally associated with aging, CS has increasingly been reported in younger populations due to lifestyle changes and prolonged use of digital devices.[1,3,4] This review aims to examine the latest literature on the epidemiology, risk factors, and management approaches to CS, particularly over the last five years.

Epidemiology and Prevalence

Recent studies have underscored the growing prevalence of neck pain—a common symptom of CS—among students and working professionals. In a study conducted among female physiotherapy students in India, 20.1% reported neck pain, with a higher incidence among those of normal BMI, and a substantial number reported functional limitations impacting their daily activities.[1]

The COVID-19 pandemic has further intensified this issue. Shah and Desai observed that 42.9% of individuals working from home reported neck pain, and nearly 70.5% had musculoskeletal complaints, highlighting the effect of remote work environments on spinal health.[2]

Another notable cross-sectional study among medical students revealed a 58.3% prevalence of neck pain within a year, with strong associations between gadget use and pre-existing pain history.[3] Similarly, research conducted among university students in Saudi Arabia found that over 59% experienced neck or shoulder pain due to extended smartphone and computer usage.[4]

Risk Factors

The etiology of CS is multifactorial. Prolonged poor posture, screen time, lack of ergonomic setup, psychological stress, and insufficient physical activity have all been identified as key risk contributors.[5-7]

Kazeminasab et al. emphasized the biological and psychological underpinnings of neck pain, suggesting that psychosocial factors may exacerbate the impact of physical strain.[5] In a study on Indian IT professionals, Siddiqua et al. reported a 28% prevalence of neck pain, with higher susceptibility among females and older age groups. They also highlighted the protective effect of regular exercise.[6]

Mizobuchi et al. identified workplace ergonomics, including workstation setup and posture, as critical determinants of musculoskeletal complaints. The study highlighted the relevance of both physical and psychosocial domains in understanding and managing neck pain.[7]

In adolescents and school-aged children, Gheysvandi et al. pointed to improper furniture and posture, heavy school bags, and excessive academic load as key triggers for neck discomfort.[8]

Diagnosis

Diagnosis of CS typically involves clinical evaluation supported by imaging such as X-rays, CT scans, or MRI.[9] Ibrahim et al. note that although many individuals with radiographic signs of CS remain asymptomatic, those who develop symptoms may experience axial neck pain, radiculopathy, or myelopathy.[9]

Radiographic studies by Forsberg et al. confirmed that degenerative changes like facet joint abnormalities and intervertebral disc narrowing are prominent in symptomatic patients.[13]

Management and Treatment Approaches

1. Conservative and Physiotherapeutic Interventions

Recent literature supports multimodal management. Kachhadiya et al. reviewed various advanced physiotherapeutic interventions such as manual therapy, cervical traction, cranio-sacral therapy, and virtual reality exercises that showed efficacy in pain reduction and improved cervical mobility.[10]

Another study highlighted the role of ergonomic latex pillows, deep cervical flexor training, and yoga asanas in relieving CS symptoms. These interventions, especially when personalized, were effective in reducing disability and enhancing quality of life.[10]

2. Ergonomic Interventions

Multiple studies underscore the importance of ergonomic interventions. Ergonomics-focused programs involving chair adjustments, proper screen height, and regular breaks were associated with a significant reduction in neck and upper limb pain among university students and office workers.[11,12]

Bleecker et al. reported that up to 89% of participants with ergonomic interventions and medical treatment showed symptom improvement. The most cited ergonomic stressors included poor typing posture, improper keyboard height, and lack of breaks.[11]

3. Surgical Interventions

For patients with cervical spondylotic myelopathy (CSM), non-operative management may increase the risk of neurological deterioration. Yu-Chun et al. noted that surgical decompression—especially anterior approaches—has become increasingly common and is associated with better outcomes in selected cases.[12]

Prevention Strategies

The burden of CS can be significantly mitigated through early preventive interventions. Public health measures that promote ergonomic awareness, encourage regular physical activity, and limit screen time are essential.[5,6,11]

Educational institutions should focus on correct posture training and optimize classroom ergonomics.[8]

Incorporating physical activity programs and providing ergonomic support at workplaces can reduce the incidence of CS.[6,11] Moreover, policy frameworks that mandate ergonomics in schools and workplaces can be transformative.

Flowchart: Management Pathway for Cervical Spondylosis

A [Patient Presents with Neck Pain/Symptoms] --> B{Initial Assessment & Clinical Evaluation}

B --> C{Consider Risk Factors: Digital Use, Posture, Ergonomics, Psychosocial Stress}

C --> D{Imaging Studies: X-ray, CT, MRI}

D --> E{Diagnosis: Cervical Spondylosis}

E --> F{Symptomatic?}

F -- No --> G[Monitor & Educate on Prevention]

F -- Yes --> H{Severity of Symptoms/Presence of Myelopathy?}

H -- Mild to Moderate --> I[Conservative Management]

I --> J[Physiotherapy: Manual Therapy, Traction, Exercises]

I --> K[Ergonomic Interventions: Workspace Adjustments, Posture Correction, Breaks]

I --> L[Lifestyle Modifications: Exercise, Yoga, Stress Management]

K --> M{Symptom Improvement?}

M -- Yes --> G

M -- No --> H

H -- Severe/Myelopathy --> N[Surgical Consultation]

N --> O[Surgical Decompression (e.g., Anterior Approaches)]

O --> P[Post-Surgical Rehabilitation]

P --> G

II. Discussion

Cervical spondylosis, once considered a condition of aging, has seen a demographic shift, now affecting younger individuals due to increased gadget use and poor posture habits.[1,3,4,6] The reviewed literature emphasizes the multifactorial nature of the condition—highlighting lifestyle, ergonomic, and psychosocial contributors.[5-8]

While physiotherapy and ergonomic modifications serve as effective first-line interventions, timely surgical management may be necessary for patients with severe symptoms or myelopathy.[9,10,12] The evidence strongly supports a multimodal and interdisciplinary approach to diagnosis, management, and prevention.[10-12]

III. Conclusion

Cervical spondylosis is an emerging public health concern, particularly among younger populations exposed to prolonged screen use and suboptimal ergonomics.[1,3-6] Comprehensive management strategies that integrate physiotherapy, ergonomics, lifestyle modifications, and when necessary, surgical intervention, can significantly improve patient outcomes.[9-12] Promoting awareness, early diagnosis, and preventive strategies is vital to reducing the personal and societal burden of cervical spondylosis.

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