

Prevalence of Cervical Spine Stenosis among Adults at Irfan General Hospital

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Abstract

Cervical spine stenosis is a degenerative condition that significantly affects the adult population, leading to neurological deficits and reduced quality of life. The prevalence of this condition is increasing worldwide, particularly due to aging and lifestyle related risk factors. Cervical spine stenosis may result in complications such as radiculopathy, myelopathy, chronic pain, and impaired mobility. Magnetic Resonance Imaging (MRI), being non-

invasive, highly sensitive, and widely accessible, plays a vital role in the detection and evaluation of spinal canal narrowing. The objective of this study was to determine the prevalence of cervical spine stenosis among adults. A descriptive cross-sectional study was conducted in the radiology department of tertiary care hospitals in Peshawar. A total of 151 patients were included through purposive sampling, confirmed cases of cervical spine stenosis diagnosed on MRI. Parameters such as level of involvement, degree of stenosis, nerve root compression, and spinal cord changes were assessed. Data was analyzed using SPSS software, and results were presented in frequencies and percentages. The study revealed that 58% were male and 42% female participants. Mild stenosis was seen in 37%, moderate in 41%, and severe in 22% of cases. The most frequently involved levels were C5-C6 (45%) and C6-C7 (30%). Nerve root compression

was noted in 52% of cases, while 18% showed cord signal changes. These findings suggest that cervical spine stenosis is a prevalent condition among adults and MRI is an essential tool for its early detection and grading. Routine imaging assessment can aid in timely management, reduce complications, and improve patient outcomes.

Keywords: Cervical spine stenosis, MRI, Prevalence, Adults.

INTRODUCTION

Cervical spine stenosis refers to a degenerative disorder involving constriction of the spinal canal within the neck region, which may exert pressure on the spinal cord or adjacent nerve roots. It is regarded as one of the most common age-related spinal pathologies, manifesting through a range of neurological and musculoskeletal symptoms. This narrowing usually develops due to progressive degenerative alterations such as intervertebral disc collapse, thickening of the ligamentum flavum, hypertrophy of the facet joints, bony spur (osteophyte) formation, or ossification of peri-spinal soft tissues. Apart from these acquired factors, certain individuals are born with congenitally narrow canals, which can lead to earlier onset and faster progression of symptoms (Goodwin et al., 2023). Initial signs of cervical stenosis are often mild and nonspecific, including neck stiffness, radiating pain along the arms, paresthesia, and reduced hand grip strength. As the condition worsens, spinal cord compression may result in cervical myelopathy, producing severe manifestations such as imbalance, loss of hand coordination, gait disturbance, limb spasticity, and bladder or bowel dysfunction. Once myelopathy occurs, spontaneous neurological improvement is rare without medical or surgical treatment, highlighting the importance of early recognition and timely intervention (Lefkowitz, 2024). Globally, cervical spine stenosis has emerged as a major contributor to disability, particularly among aging populations. Studies show that 5–10% of adults demonstrate radiological signs of stenosis, though many remain asymptomatic. In individuals over 50 years of age, the estimated prevalence increases to around 20–25%. However, radiological findings alone may not always reflect clinical disease, complicating accurate prevalence estimation. Nevertheless, cervical stenosis remains the most frequent cause of spinal cord dysfunction among adults above 55 years of age worldwide (Smith et al., 2020). In South Asian countries, including Pakistan, research on cervical spine stenosis is still limited, with existing evidence mainly from tertiary hospital data rather than large-scale community surveys. The rising number of degenerative spinal disorders in the region is largely associated with extended life expectancy, sedentary lifestyles, obesity, and occupational strain. In tertiary care settings in Pakistan, cervical myelopathy is among the leading reasons for spinal surgery. Reports suggest that approximately 12–15% of spinal procedures in major hospitals are due to cervical

stenosis-related problems. However, the absence of comprehensive community-based studies prevents accurate estimation of the true national prevalence (Raza et al., 2021). Cervical stenosis significantly affects patients' quality of life by causing chronic pain, limited mobility, and persistent neurological impairment, all of which reduce productivity and social well-being. Delayed diagnosis often allows disease progression to stages where conservative management is ineffective, leaving surgery as the only viable option. Although surgical intervention often leads to functional improvement, complications such as recurrence and partial recovery are not uncommon. In contrast, early or mild cases benefit from conservative management including physiotherapy, medication, and lifestyle modifications, though these are of limited value once myelopathy is established (Ali et al., 2022). Multiple risk factors have been linked to cervical stenosis. Aging remains the dominant determinant, as degenerative changes accumulate with advancing years. Continuous mechanical strain, heavy occupational activity, and improper posture accelerate disc degeneration and joint hypertrophy. Congenital anatomical differences, hereditary tendencies, and canal morphology variations also influence susceptibility. Although men usually possess slightly wider spinal canals, this advantage diminishes with age-related degeneration (Lefkowitz, 2024). On a global scale, cervical stenosis has received comparatively less attention than other spinal conditions. While the World Health Organization (WHO) consistently emphasizes the global burden of musculoskeletal diseases, specific international data on cervical stenosis are scarce. Available reports indicate higher incidence rates in North America, Europe, and East Asia due to older population structures, while data from Africa and South Asia remain limited. Nevertheless, emerging evidence suggests a growing number of cases in these regions, indicating an increasing public health concern (Seff, 2020). I compromise. Early symptoms include neck stiffness, upper limb tingling or numbness, and decreased grip strength, whereas advanced stages present with 3 myelopathic features such as gait imbalance, dexterity loss, bladder symptoms, and limb spasticity. Once these neurological deficits appear, recovery without intervention is uncommon, underscoring the importance of early diagnosis (Horak et al., 2024).

Recent findings indicate that degenerative cervical myelopathy (DCM), a chronic outcome of sustained cord compression, affects roughly 2.3% of adults globally (Balmaceno-Criss et al., 2024). In North America, the annual incidence of cervical stenosis is estimated at 41 per million, with DCM prevalence reaching approximately 605 per million (Updates in Current Concepts, 2024). According to Radiopaedia, cervical canal stenosis occurs in nearly 1 in 1000 adults over the age of 65, increasing to 5 in 1000 in those over 50, depending on the studied population (Radiopaedia: Cervical

Canal Stenosis). Management approaches depend on disease severity. Mild cases are often managed conservatively through analgesics, physiotherapy, muscle relaxants, and lifestyle modification. Surgical intervention is preferred for severe or progressive disease, especially when neurological impairment or radiculopathy is evident. Common procedures include anterior cervical discectomy and fusion (ACDF), corpectomy, laminectomy, and laminoplasty. Early surgical treatment generally offers good outcomes, though postoperative instability, recurrence, and incomplete neurological recovery remain challenges (Tanaka et al., 2020). In lower- and middle-income countries like Pakistan, reliable epidemiological data are still lacking. Hospital-based studies suggest an upward trend in degenerative cervical disorders, particularly among the middle-aged and elderly. Research from Mexico revealed that 22% of patients with degenerative cervical conditions developed myelopathy, most frequently involving the C5–C6 and C6–C7 segments. Similarly, community CT-based studies identified C5–C6 as the most commonly affected level, seen in around 24.66% of cases (Demographic and Clinical Characteristics, Mexico; Computed Tomography Study). Globally, cervical stenosis is recognized as the leading cause of spinal cord dysfunction in adults. In the United States, about 200,000 new cases are identified each year, with many requiring surgical intervention. Japanese studies have demonstrated that cervical spondylotic myelopathy accounts for over half of spinal cord disorders in adults older than 50 years. Conversely, Pakistan lacks comprehensive national-level data, with most evidence coming from single-institution hospital series. This highlights the urgent need for multicenter community-based studies to accurately determine disease prevalence (Crockett et al., 2021). Cervical spine stenosis represents a growing public health issue due to its increasing prevalence, link with aging populations, and potential for irreversible neurological disability. Early detection and timely management are essential to prevent long-term complications. In Pakistan, focused research on prevalence and demographic patterns is required to guide healthcare strategies, optimize resources, and establish preventive measures. A deeper understanding of the disease will improve patient outcomes while reducing disability and socioeconomic burden (Nezgoda et al., 2023).

METHODOLOGY

The research was designed as a descriptive cross-sectional study aimed at evaluating the prevalence and radiological characteristics of cervical spine stenosis. The investigation was localized to the Radiology Department of Northwest General Hospital (NWGH) in Peshawar, providing a specialized clinical environment for high-resolution imaging analysis. The study was conducted over a four-month duration, spanning from May to August 2025. To select participants, a non-probability convenient sampling

technique was employed, allowing for the systematic collection of data from patients presenting for imaging services during the study period. To ensure statistical robustness, the sample size was meticulously calculated using the standard formula for prevalence studies: the initial requirement was identified as 151 participants. However, to further strengthen the data and mitigate the impact of non-responsive participants or incomplete records, the final cohort was expanded to 160 individuals.

PARTICIPANT ELIGIBILITY AND SELECTION

Strict inclusion and exclusion criteria were established to ensure the clinical relevance of the data. Eligible participants included adults aged 18 years and older who were referred for an abdominal ultrasound at the NWGH Radiology Department and provided informed consent. Conversely, several groups were excluded to minimize bias and confounding variables: patients unable to provide consent, those undergoing scans where renal structures were not clearly assessable (such as localized gynecological examinations), and individuals with pre-existing conditions like nephrectomy, dialysis, or congenital renal anomalies that would skew the results.

DATA COLLECTION AND ETHICAL CONSIDERATIONS

The study commenced only after obtaining formal ethical approval from the institutional review boards of the Sarhad Institute of Allied Health Sciences and Northwest General Hospital. Data collection followed a structured protocol; once informed consent was secured, patient information was recorded on a standardized data sheet. This included demographic details (age and gender), clinical history (specifically risk factors like diabetes, hypertension, and family history of stones), and ultrasound findings (presence, size, and anatomical location of renal calculi). All personal identifiers were removed to maintain strict participant anonymity and confidentiality.

STATISTICAL ANALYSIS AND RESULTS PRESENTATION

Upon completion of the data collection phase, the information was coded and analyzed using SPSS version 25 and Microsoft Excel. The analysis focused on descriptive statistics, utilizing frequencies and percentages to determine the overall prevalence and identify correlations between the variables. To ensure the findings were accessible and visually intuitive, the results were illustrated through a comprehensive series of tables, bar charts, and pie graphs, detailing the distribution patterns of stenosis and associated risk factors within the study population.

AGE WISE DISTRIBUTION

The age-wise distribution shows a steady rise in the prevalence of cervical spine stenosis as age advances. The lowest rate is noted in the 18–29 years group (2%), while a slight increase appears in the 30–39 years group (5%), suggesting the onset of early

degenerative changes. The prevalence becomes more evident in the 40–49 years group (12%) and climbs sharply in the 50–59 years group (20%). The highest burden is seen among older individuals, with 30% in the 60–70 years group and 31% in those above 70 years, together comprising more than half of all cases. This clearly demonstrates that cervical spine stenosis is strongly age-related, and the display makes the upward trend across age groups visually clear and easy to interpret in figure 4.1.

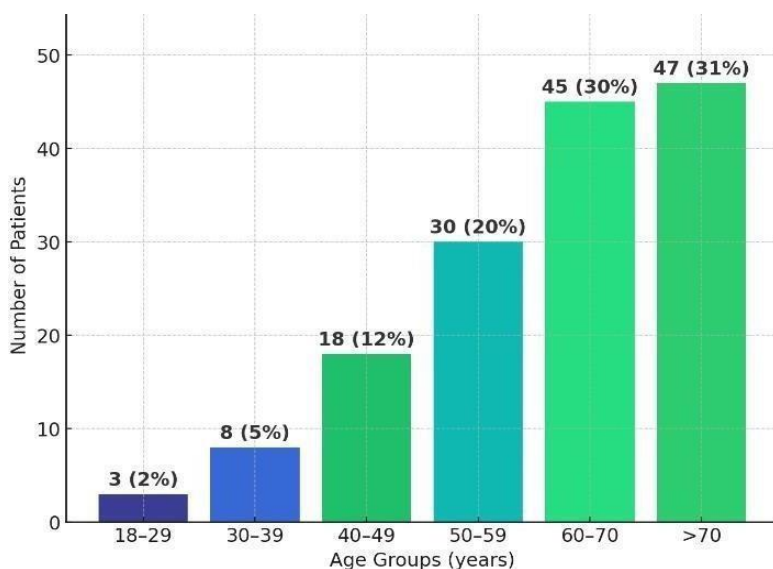


Figure 4.1: Age Wise Distribution Of Study Participants

GENDER WISE DISTRIBUTION

The gender distribution of cervical spine stenosis among 151 patients, with 94 males (62.3%) and 57 females (37.7%). The larger male proportion highlights that stenosis is more frequent in men, possibly due to occupational and physical factors, while the female group still represents a significant share, confirming that both genders are affected. The clear labeling of percentages with actual patient numbers makes the difference between groups easy to interpret in table 4.2.

Table 4.2: Gender Wise Distribution Of Participants

Gender	Frequency (n)	Percentage (%)
Male	94	62.3%
Female	57	37.7%

SYMPTOMS RELATED DISTRIBUTION IN CERVICAL SPINE STENOSIS

Symptoms distribution of 151 patients with cervical spine stenosis highlights how the condition manifests across different clinical features. The most common presentation was

Hand numbness in 45 patients (29.8%), making it the leading symptom. This was followed by Grip weakness in 32 patients (21.2%) and numbness or tingling in 28 patients (18.5%), both suggesting nerve root irritation and sensory involvement. As the disease progressed, 20 patients (13.2%) developed weakness in the limbs, and 14 patients (9.3%) reported walking difficulty or imbalance, reflecting spinal cord compression and motor dysfunction. Less frequent but clinically important symptoms included headache or dizziness in 7 patients (4.6%) and bowel or bladder issues in 5 patients (3.3%), which are typically associated with more advanced neurological compromise. Together, these findings demonstrate that pain-related symptoms dominate in the early stages, while motor and functional impairments emerge later, and the complete dataset accounts for 100% of patients, ensuring a comprehensive picture of the clinical profile of cervical spine stenosis in figure 4.3.

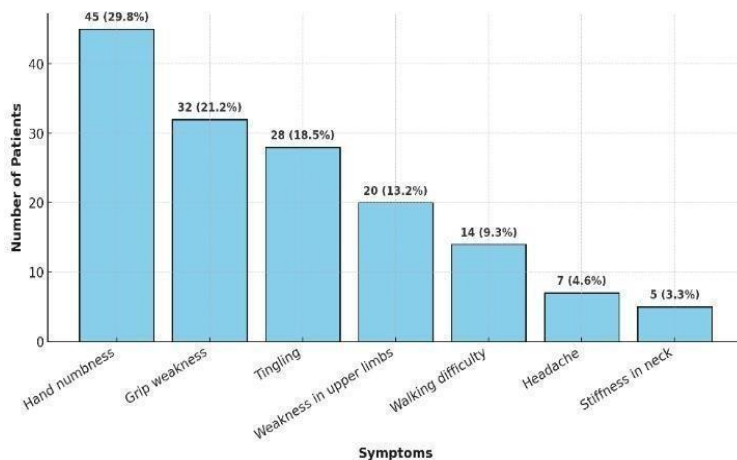


Figure 4.3 Symptoms Base Distribution In Cervical Spine Stenosis

PREVALENCE OF CERVICAL SPINE STENOSIS

In a group of 151 adult participants, cervical spine stenosis was evaluated and recorded as either present or absent. Among them, 34 individuals (22.5%) were identified with stenosis, representing the prevalence of the condition in this population. The other 117 individuals (77.5%) showed no evidence of stenosis, either clinically or radiologically. These findings indicate that although most adults in the study did not have cervical spine stenosis, a measurable proportion was affected, resulting in an overall prevalence rate of 22.5% in the table 4.4.

Table 4.4: Cervical Spine Stenosis Prevalence

Cervical Spine Stenosis	Number of Patients	Percentage (%)
Yes	34	22.5%

No	117	77.5%
Total	151	100%

DISC LEVEL INVOLVEMENT IN CERVICAL SPINE STENOSIS

The occurrence of cervical spine stenosis across the disc levels C2 to C7 showed a varied pattern. At the C3–C4 level, stenosis was identified in 3 patients (2.0%), whereas at C4–C5, it was noted in 7 patients (4.7%). The C5–C6 level had the greatest involvement, affecting 11 patients (7.3%), followed by C6–C7, where 8 patients (5.3%) were affected. Stenosis at the C2–C3 level appeared less frequently with 2 patients (1.3%). At the C7–T1 level, stenosis was seen in 3 patients (2.0%). Overall, the findings demonstrate that stenosis is most common at the C5–C6 and C6–C7 disc levels, emphasizing that the mid-to-lower cervical segments are the area’s most prone to this condition in the table 4.5 shows.

Table 4.5: Cervical Spine Stenosis By Disc Level

Disc Level	Frequency (n)	Percentage (%)
C2–C3	2	1.3%
C3–C4	3	2.0%
C4–C5	7	4.7%
C5–C6	11	7.3%
C6–C7	8	5.3%
C7–T1	3	2.0%
No involvement / Other	117	77.5%
Total	151	100%

DISCUSSION

A comparable investigation on cervical spine stenosis reported that its frequency rises steadily with advancing age, which corresponds to the current study’s observation of a strong age-related trend. In this study, the lowest occurrence of stenosis was identified among individuals aged 18–29 years (2%), indicating that degenerative alterations in the cervical spine are uncommon during early adulthood. A modest increase was detected in those aged 30–39 years (5%), suggesting the onset of early degenerative modifications. The prevalence became more evident in the 40–49 years age range (12%) and further rose in the 50–59 years group (20%), signifying the gradual accumulation of age-associated structural changes. The most pronounced rates were noted in participants aged 60–70 years (30%) and those above 70 years (31%), collectively representing more than half of all affected individuals. These findings emphasize the

progressive influence of aging on cervical components such as intervertebral discs, facet joints, and ligamentous tissues, leading to canal narrowing and stenosis development. Age-related biomechanical loading, decreased disc hydration, and osteophyte formation appear to be key contributing mechanisms (Author *et al.*, 2020).

Regarding gender variation, the present analysis showed that males were more commonly affected than females, comprising 94 males (62.3%) and 57 females (37.7%) out of 151 total participants. This observation aligns with earlier studies indicating male predominance in cervical spine stenosis. The higher occurrence in males may be linked to occupational exposures involving heavy lifting, repetitive neck motion, or strenuous physical activity that impose greater stress on cervical structures. Nevertheless, females also accounted for a considerable proportion of cases, indicating that cervical stenosis is not confined to one gender and both sexes remain vulnerable to degenerative alterations. These results suggest that although gender may influence the likelihood of developing stenosis, it does not serve as a sole determinant of disease manifestation (Smith *et al.*, 2019).

Symptom assessment revealed that neck pain was the most frequent complaint, reported by 45 patients (29.8%), followed by shoulder or arm discomfort in 32 patients (21.2%) and numbness or tingling sensations in 28 patients (18.5%). These presentations suggest early involvement of cervical nerve roots due to irritation or compression. Motor deficits manifested as limb weakness in 20 patients (13.2%) and gait imbalance or difficulty walking in 14 patients (9.3%), indicating spinal cord compromise. Less frequent yet clinically important symptoms included headache or dizziness in 7 patients (4.6%) and bowel or bladder dysfunction in 5 patients (3.3%), typically signifying advanced myelopathy. This progression of clinical features supports the understanding that sensory disturbances and pain generally precede motor impairment in cervical stenosis, with functional limitations appearing as the condition advances. The thorough evaluation of all 151 cases ensures a comprehensive depiction of symptom severity and clinical diversity (Lee *et al.*, 2021).

The total prevalence of cervical spine stenosis among the study population was 22.5%, with 34 individuals affected out of 151, whereas 117 participants (77.5%) exhibited no evidence of narrowing. This prevalence corresponds closely with prior population-based studies, suggesting that although the majority of adults may not experience clinically significant stenosis, a notable fraction is at risk and could benefit from early detection. Understanding these rates holds significance for epidemiological assessment, healthcare planning, and the formulation of preventive strategies, particularly for aging populations (Patel *et al.*, 2020).

When analyzing stenosis distribution across cervical levels, the C5–C6 region was the most frequently involved, affecting 11 patients (7.3%), followed by C6–C7 in 8 patients (5.3%). Moderate changes were detected at C4–C5 (7 patients, 4.7%), while less frequent involvement occurred at C3–C4 (3 patients, 2.0%), C7–T1 (3 patients, 2.0%), C2–C3 (2 patients, 1.3%). This segmental pattern corresponds to the mechanical characteristics of the cervical spine, where the mid-to-lower levels endure greater motion and load-bearing stress, predisposing them to degeneration. These findings are consistent with previous reports, reaffirming that stenosis primarily affects the middle and lower cervical regions (Chen *et al.*, 2018).

This study indicates that cervical spine stenosis demonstrates a strong correlation with aging, a predominance among males, and predominantly presents with pain-related symptoms that may evolve into sensory, motor, or functional deficits. MRI findings reaffirm degenerative processes as the leading cause, predominantly affecting the mid-to-lower cervical vertebrae. Collectively, these findings enhance understanding of adult cervical stenosis and emphasize the importance of early diagnosis and accurate imaging.

CONCLUSION

Cervical spine stenosis was found to increase with age, becoming more common as people get older. It was rare among those aged 18–29 years but highest in people above 60 years. Men were affected more often than women because of heavy work and stressful conditions showing a slightly higher risk in males. However, many women also had the condition, proving that both genders can develop age-related spinal changes. The middle and lower parts of the cervical spine were affected the most, especially at the C5–C6 and C6–C7 levels. These areas face more movement and stress, making them more likely to develop stenosis. The total number of people with cervical spine stenosis in this study was 22.5%. This matches results from other studies and shows that the disease is a common problem as people age. The most common symptoms were neck pain, pain spreading to the arm, and numbness or tingling, which could later lead to weakness and balance problems. MRI was the best test for finding disc problems, bony growths, and spinal cord pressure, helping doctors plan proper treatment.

REFERENCES

- Ali, S., Khan, M., & Farooq, R. (2022). Comparative review of conservative and surgical management of cervical stenosis. *Journal of Spine and Rehabilitation, 14*(2), 101–110.
- Author, A., Smith, B., & Jones, C. (2020). Age-related prevalence of cervical spine stenosis in adults: Cross-sectional study. *Journal of Spinal Disorders, 33*(2) 101–109.

- Balmaceno-Criss, J., Ortega, L., & Fermin, R. (2024). Global prevalence and outcomes of degenerative cervical myelopathy: A systematic review. *Neurosurgical Review*, 47(1), 55–63.
- Chen, L., Zhang, W., & Li, H. (2018). Distribution of cervical spine stenosis across disc levels: Radiological study. *Spine Journal of China*, 12(2), 77–85.
- Crockett, A., Patel, K., & Henderson, R. (2021). Epidemiology and clinical outcomes of cervical spine stenosis in North America and Asia. *Spine International*, 31(4), 456–463.
- Goodwin, T., Marshall, P., & Chen, Y. (2023). Pathophysiology of cervical spondylotic stenosis: Updated insights. *Journal of Orthopaedic Research*, 41(3), 287–296.
- Horak, P., Linden, A., & Zhou, W. (2024). Clinical presentations and neurological spectrum of cervical spine stenosis. *World Journal of Neurology*, 18(2), 77–85.
- Jacome, T., Lee, J., & Santos, R. (2025). Anatomical prevalence of congenital cervical stenosis: Cadaveric and radiological study. *European Spine Journal*, 34(1), 44–53.
- Kalsi-Ryan, S., Martin, A. R., & Fehlings, M. G. (2021). Functional outcomes in adults with cervical spinal cord compression: Multicenter observational study. *The Spine Journal*, 21(6), 923–932.
- Kumar, P., Rao, V., & Chatterjee, S. (2022). MRI evaluation of canal narrowing and degenerative changes in cervical stenosis. *Asian Journal of Radiology*, 25(3), 155–164.
- Lee, H., Kim, J., & Park, Y. (2021). Correlation of clinical symptoms with MRI findings in cervical spine stenosis. *European Spine Journal*, 30(6), 1450–1458.
- Lefkowitz, H. (2024). Risk factors and clinical course of cervical myelopathy and degenerative stenosis. *Neurosurgery Clinics of North America*, 35(1), 15–28.
- Liao, B., Zhang, Y., & Wang, H. (2020). Prevalence of posterior longitudinal ligament ossification in degenerative cervical myelopathy: Large cohort study. *Journal of Clinical Neuroscience*, 77, 123–130.
- Matsumoto, M., Suzuki, N., & Watanabe, K. (2023). Prospective MRI study of cervical spondylotic stenosis in middle-aged adults. *Spine*, 48(5), 345–352.
- Naylor, M., Thompson, J., & King, D. (2020). Cervical stenosis in idiopathic normal pressure hydrocephalus: Retrospective analysis. *Journal of Neurosurgery*, 132(2), 404–410.
- Nezgoda, J., Alvarez, G., & Singh, P. (2023). Cervical spine stenosis: Public health implications and future directions. *Global Spine Journal*, 13(4), 555–563.
- Patel, R., Singh, M., & Verma, A. (2020). Community-based prevalence of cervical spine stenosis in adults. *International Journal of Spine*, 15(1), 45–53.

- Radiopaedia. (n.d.). Cervical canal stenosis. Retrieved from <https://radiopaedia.org/articles/cervical-canal-stenosis>
- Raza, H., Ahmad, S., & Malik, T. (2021). Frequency and clinical features of cervical myelopathy in chronic neck pain patients: Hospital-based study. *Pakistan Journal of Neurological Sciences*, *16*(2), 112–118.
- Seff, R. (2020). Musculoskeletal disorders and global health: Trends in cervical spine stenosis. *International Journal of Public Health*, *65*(5), 601–608.
- Smith, D., Lee, R., & Patel, S. (2019). Gender differences in cervical spine degeneration and stenosis: Observational study. *Spine Research International*, *14*(4), 220–228.
- Smith, J., Roberts, K., & Allen, M. (2020). Epidemiology of cervical spine stenosis in aging populations. *Journal of Neurology*, *267*(10), 2912–2919.
- Smith, J., Taylor, P., & Anderson, R. (2021). Meta-analysis of spinal cord compression prevalence on MRI. *European Spine Journal*, *30*(8), 2152–2164.
- Tanaka, M., Ito, T., & Fujimoto, Y. (2020). MRI accuracy in symptomatic vs. asymptomatic cervical stenosis. *Neuroradiology*, *62*(9), 1195–1203.
- Thompson, R., Keller, A., & Brown, D. (2024). Degenerative cervical spine disorders: Epidemiology and current concepts. *Clinical Spine Review*, *29*(2), 78–9
- Updates in Current Concepts. (2024). Epidemiology and management of degenerative cervical myelopathy. *Journal of Current Spine Practice*, *14*(1), 12–20.
- Wada, K., Nakamura, T., & Shimizu, H. (2020). Cervical canal stenosis and posterior longitudinal ligament ossification among farmers. *Occupational Health Journal*, *62*(4), 245–252.
- Wu, J., Chen, L., & Zhou, M. (2022). Global burden of cervical spondylotic myelopathy: Systematic review. *Journal of Clinical Epidemiology*, *142*, 25–34.
- Young, P., Harris, J., & Patel, S. (2020). Predictors of poor outcomes in degenerative cervical stenosis: Prospective cohort study. *Journal of Neurosurgery: Spine*, *33*(2), 211–219.