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CERVICAL SPINE EVALUATION AND MANAGEMENT IN EMERGENCY DEPARTMENT, LITERATURE REVIEW

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Abstract

Background: Emergency doctors frequently face challenges when dealing with patients who may have cervical spine injuries when they arrive at the emergency department (ED). When evaluating and transferring these patients, EPs need to be ready to handle them quickly and skillfully while safeguarding the cervical spine to avoid further neurologic damage. EPs need to be familiar with identifying and treating related injuries in addition to having a thorough understanding of the intricate anatomy of the cervical spine, the process behind injuries, and their various forms.

Additionally, EPs need to be aware of the benefits and constraints of the current imaging technology.

Methods: The Medline, Pubmed, Embase, NCBI, and Cochrane databases were searched for studies of Cervical spine evaluation and management in emergency department.

Conclusion: ervical spine injuries (CSI), which, while rare, are very serious and can cause permanent damage. Proper evaluation involves clinical and radiological assessments, with a focus on preventing further spinal cord injury (SCI) and stabilizing the spine. Treatment has shifted from conservative methods to more aggressive surgical approaches due to advances in surgery and better outcomes.

Keywords: Emergency department, Cervical spine, Spinal cord, Neurologic injury, Cooling, Corticosteroid use

Introduction

The cervical spine is made up of seven highly specialized vertebrae that articulate at the

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craniocervical joint and with the first thoracic vertebra, respectively, and are situated between the head and the thoracic vertebrae distally. The foramen transversarium, which is situated laterally in the C3 to C7 vertebrae, serves as a conduit for the blood supply to the brain, supports the head and its movements, and shields the spinal cord. The cervical spine is the most injury-prone segment of the vertebral column because of the intrinsic bone instability of the region and the over-reliance on ligamentous tissues for support. For instance, to maintain stability while allowing for the greatest amount of flexibility, the subaxial cervical spine depends on static stabilizers such as the anterior longitudinal ligament, posterior longitudinal ligament, facet joint capsules, intervertebral discs, and interspinous and supraspinous ligaments (1). According to estimates, the UK (2). sees about 1000 cases of spinal cord injuries (SCI), with cervical spine injuries (CSI) making up a sizable share of these cases. In the US, there are between 10,000 and 12,000 new SCI cases annually, with two thirds of the patients being under 30. According to a review by Milly et al. of 65 papers, 3.7% of trauma victims had CSI. The CSI prevalence for aware patients in this study was 2.8%, however the prevalence rate for clinically unevaluable patients was much higher at 7.7% (3). Most of the time, CSI is observed in people over 65 and in individuals between the ages of 15 and 30 (4). Uche et al. discovered a male to female distribution of 3.1:1 in the research cohort after conducting a retrospective ten-year multicenter investigation of CSI in the southeast of Nigeria (6). Among younger people, motor vehicle accidents, falls from heights, sports-related injuries, and assaults are the most frequent causes of CSI. Non-traumatic causes of cervical spine injuries are more common in the elderly and may include osteoporotic compression fractures, degenerative disorders of the spine, or compression fractures resulting from spinal tumors. After trauma, the most commonly injured cervical vertebrae are C5/C6 and C6/C7, with the C1/C2 vertebrae coming in second. The most frequent modes of damage include hyper-flexion, hyper-extension, rotational-type, and axial compression, which results in Jefferson-type fractures in the C1 vertebrae, occipito-condylar fractures, or burst fractures in other vertebrae b (7).

Epidemelogy:

Although the exact number of incidents of spinal cord injury is unknown, estimates for the United States and Canada place the number between 30 and 46 per million people. Of patients with spinal cord injuries, 82% are men between the ages of 16 and 30 (8). In children and adolescents, the risk of cervical spine injury rises with age (13.2 per 100,000 per year for those over 11 vs 1.2 per 100,000 for those under 11) (9). Motor vehicle accidents (47%), falls (23%), gunshot wounds/violence (14%), and sports-related activities (9%), are the leading causes of spinal

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cord injury. (10) Of patients with spinal fractures, 10% to 20% also have spinal cord injuries, and almost 50% of patients with bony cervical vertebral injuries have spinal cord injuries. Cervical fractures are thought to occur in 1% to 3% of people who have acute trauma (11). Patients with predisposed arthritic diseases, such as the following, as well as the elderly, may sustain significant cervical spine injuries after modest trauma. Psoriatic cervical spondyloarthropathy; Ankylosing spondylitis arthritis rheumatoid.

Management:

Early Management: Protecting the spine and spinal cord with immobilization devices or by manual in-line immobilization is a crucial care principle for the cervical spine. This should be done until all injuries have been thoroughly assessed and cervical spine injury has been ruled out

Airway Managemet: Many doctors believe that selecting the best method for definitive emergency airway management is a clinical conundrum, and that orotracheal intubation has risks when there is a known or suspected cervical spine injury (12). Orotracheal intubation combined with in-line immobilization has been found by multiple investigators to be a secure and reliable technique for final airway control. Gerling and colleagues demonstrated no discernible vertebral body movement during orotracheal intubation with manual in-line stabilization using a cadaver model. The question of whether video-assisted laryngoscopy (VAL) or direct laryngoscopy is safer is up for debate. Research on this topic has yielded inconsistent findings: Robitaille and associates came to the conclusion that there was no discernible difference at any level between direct laryngoscopy and VAL. Turkstra and colleagues (13). discovered that using VAL resulted in a 50% reduction in C-spine motion at the C2-5 segment. The gold standard for airway care for traumatized apneic patients is orotracheal intubation combined with in-line manual cervical spine immobilization, according to the most recent Advanced Trauma Life Support (ATLS) recommendations.

Treatment:

Decompressing neural structures, preventing or correcting segmental collapse and deformity, restoring normal spinal mechanics, avoiding and managing comorbidities, and facilitating early ambulation and rehabilitation are the guiding principles of care for anyone with a spinal injury.

Non-operative therapy has been the cornerstone of treatment for spinal injuries until recent advancements and breakthroughs in the surgical management of spine injuries. Even with the

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amazing breakthroughs and developments in spine surgery, conservative care is still important for treating spinal injuries, whether it be from the outset, as a post-operative adjunct, or as the last resort (14) Traction and, preferably, external fixation, halo-vests, and cervical braces are used in the non-operative treatment of cervical spine fractures. For all fractures that are not unstable or dislocated, conservative therapy is recommended.

Medical Therapy

From a pharmaceutical standpoint, all other medications failed to demonstrate any benefits in clinical efficacy trials, with the exception of high-dose Methylprednisolone Sodium Succinate (MPSS), which shown minor results in the historic National Acute Spinal Cord Injury Study (NASCIS) experiment. MPSS has anti-inflammatory and immunosuppressive properties. However, questions have been raised concerning MPSS's safety and effectiveness in treating patients with acute SCI. After a systematic review on the use of MPSS in acute SCI, Fehlings et al. recommended against giving patients with acute SCI 24-hour infusions of high-dose MPSS after 8 hours and 48-hour infusions. It is specifically advised against utilizing MPSS for acute SCI treatment in the UK's NICE recommendations (14).

Surgical Treatment:

Surgical management of spinal cord injury (SCI) is indicated in the following cases: unstable injuries, progressive neurological deterioration, early mobilization of neurologically compromised patients, and patients with a high incidence of late complications, such as 30° kyphosis or a 50% loss of height. Surgical management of spinal cord injury (SCI) is indicated in the following cases: unstable injuries, progressive neurological deterioration, early mobilization in neurologically compromised patients, and patients with a high incidence of late complications, such as kyphosis of 30° or more than 50% loss of height (15).

Conclusion:

Even though they are rare, cervical spine injuries are severe and can result in permanent impairment. A thorough clinical and radiological evaluation, a customized treatment plan, and a high index of suspicion are necessary when evaluating individuals with a suspected CSI. The goal of treatment is to stop the progression of SCI and stabilize the spine so that the patient can be left alone. Although conservative treatments had been the cornerstone of care, more aggressive surgical approaches are now the preference due to recent advancements in surgical methods and improved outcomes.

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