Management of patients with non-traumatic spinal cord injury

Key points

The incidence of non-traumatic spinal cord injury is rising due to the ageing of the population.

The most common causes are tumours and degenerative disorders of the spine.

It often has devastating physical and psychological consequences for patients.

Assessment and treatment in a specialist spinal cord injury centre is essential.

Traumatic spinal cord injury (TSCI) caused by an external event, such as a road traffic accident, previously accounted for the largest portion of spinal cord compression (SCC) cases in the general spinal cord injury population worldwide (Cosar et al, 2010). However, the incidence of non-traumatic spinal cord injury (NTSCI), caused by pathology such as infection or tumours, appears to be rising (Barclay et al, 2017) – New and Biering-Sørensen (2017) suggest that, in many countries, the incidence of NTSCI is higher than that of TSCI, making it an area of growing significance (Kennedy and Hasson, 2016).

The prevalence of NTSCI has not been widely reported as literature has focused on TSCI; however, New et al (2014) suggested the median rate of NTSCI was six cases per million per year in eight Western European countries, with 25% being caused by tumours and 32% by degenerative conditions. The authors noted that the reporting of NTSCI was poor. Furlan et al (2013) reported 15 new cases per million per year of TSCI in western Europe. The higher reported number of TSCI may explain why research has focused in this area.

NTSCI is most likely to affect older people (Cosar et al, 2010) and, due to the ageing of the population, incidence rates are expected to rise (New et al, 2013). This article provides an overview of NTSCI to help nurses meet patients’ needs.

Causes

According to New et al (2015), the main causes of NTSCI are spinal tumours and degenerative disorders of the spinal column, followed by vascular and autoimmune disorders. Causes are summarised in Table 1 and detailed below.

Spinal tumours

Primary benign tumours can occur anywhere along the spinal cord and take years to grow to a size that causes neurological symptoms. Primary malignant tumours of the spine tend to grow quickly and spread into surrounding tissue; it is difficult to predict their progress and effects. Cancerous metastases in the spinal cord or bones mainly result from primary cancers in the lung, breast, bowel or prostate (Spinal Injuries Association, 2014).

Degenerative disorders

The most frequent cause of neurological loss related to degenerative disease of the spine is extruded disc material.

Keywords

Spinal stroke/Disc degeneration/Neurological loss

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In this article...

● Causes of non-traumatic spinal cord injury
● Physical and psychological effects of reduced sensory and motor functions
● Benefits of specialist rehabilitation in non-traumatic spinal cord compression

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Abstract

Non-traumatic spinal cord injury is caused by a number of medical conditions and requires specialist management to prevent physical and psychological complications. This article discusses its causes, medical treatment and nursing management, highlighting the specialised care required and the rationale for it, to give general nurses an insight into the needs of this patient group.

Citation

Spinal strokes occur when there is disruption in the blood supply to the spinal cord, commonly caused by a blood clot that blocks or partially blocks a blood vessel. Clots can form in the spinal cord vessels, but also travel to the spinal cord having formed in other parts of the body. Spinal strokes can also occur when there is bleeding from a blood vessel due to a small tear; they are rare compared with cerebral strokes. Common causes of spinal stroke are damaged arteries due to atherosclerosis, weakness and narrowing. Contributory factors are high blood pressure, smoking, diabetes and malformed blood vessels.

Other vascular conditions that can cause NTSCI are aneurysms and haematomas (SIA, 2014).

Vascular
Spinal strokes occur when there is disruption in the blood supply to the spinal cord, commonly caused by a blood clot that blocks or partially blocks a blood vessel. Clots can form in the spinal cord vessels, but also travel to the spinal cord having formed in other parts of the body. Spinal strokes can also occur when there is bleeding from a blood vessel due to a small tear; they are rare compared with cerebral strokes. Common causes of spinal stroke are damaged arteries due to atherosclerosis, weakness and narrowing. Contributory factors are high blood pressure, smoking, diabetes and malformed blood vessels.

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Inflammatory/autoimmune
Transverse myelitis is a neurological disorder that can be caused by an autoimmune reaction against the spinal cord or a bacterial or viral infection. Sometimes its cause is unknown. Symptoms include flu-like feelings around the time of neurological loss (SIA, 2014).

Effects
The severity of disability caused by NTSCI depends on the amount and location of damage. The spinal cord acts as a communication channel between the brain and body via ascending sensory and descending motor and autonomic pathways (Rossignol, 2013). If an injury results in the spinal cord not losing complete ability to convey impulses past the cord damage, patients are more likely to have incomplete cord lesions; this means that sensory and motor functions are retained to varying degrees below the injury (Teufack et al, 2013).

Signs and symptom of NTSCI include:
- Pain;
- Weakness in limbs;
- Altered sensation such as pins and needles;
- Loss of bladder and bowel control;
- Reduced function (SIA, 2014).

Medical management
Medical management depends on the cause. Usual investigations are imaging (including magnetic resonance) and blood tests – and, sometimes, more-invasive procedures such as lumbar punctures or angiograms.

Spinal cord infarcts do not have a specific treatment, but patients are often prescribed antiplatelet drugs such as aspirin. If the cause is an immune condition, patients are initially treated with steroids, often followed by plasma exchange or intravenous immunoglobulin therapy. Longer-term immunosuppression depends on the condition and risk of relapse. Haematomas, tumours and degenerative conditions usually require surgery although, on occasion, tumours may be managed with radiotherapy or chemotherapy, depending on their nature.

Nursing management
The care of patients with NTSCI requires functional assessment to determine how to maximise function and quality of life. Ideally, assessment and treatment should be provided at a specialist spinal rehabilitation centre. Patients in acute care settings who have been diagnosed with NTSCI should be referred to a specialist rehabilitation consultant for assessment. Referral to specialist centres can be made via the National Spinal Cord Injury Database (www.nscisb.nhs.uk).

The National Institute for Health and Care Excellence (2008) recommended that patients who are admitted to hospital with metastatic spinal cord compression (MSCC) should “have access to a full range of health professional support services for assessment, advice and rehabilitation”. Robinson et al (2018) report that specialist inpatient rehabilitation has been shown to improve functional outcomes for patients with NTSCI – however, not all patients receive specialist rehabilitation and, if they fall into this group, their management is much less coordinated (New et al, 2011). Box 1 presents a case study illustrating how specialist rehabilitation can improve function.

NICE (2008) also suggested that rehabilitation for patients with MSCC should focus on the patient’s goals and what is

<table>
<thead>
<tr>
<th>Aetiology or cause</th>
<th>Example</th>
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<tbody>
<tr>
<td>Spinal tumour</td>
<td>Lymphoma, Metastases from lung, breast, bowel or prostate cancer</td>
</tr>
<tr>
<td>Degenerative disorders</td>
<td>Degenerative disc disease, Herniated disc, Spinal stenosis</td>
</tr>
<tr>
<td>Vascular</td>
<td>Spinal stroke, Aneurysm, Haematoma</td>
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<tr>
<td>Inflammatory/autoimmune</td>
<td>Transverse myelitis</td>
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NTSCI = non-traumatic spinal cord injury

Spinal stenosis of the lumbar spine, shown on a computed tomography scan, is the result of a degenerative disorder and a cause of non-traumatic spinal cord injury

Table 1. Causes of NTSCI
Clinical Practice

Review

Box 1. Case study

Colin Thomas*, aged 61, presented with a seven-month history of mild thoracic back pain along with some radiating pain into the arms and shoulders. A magnetic resonance imaging scan at the local hospital showed an intramedullary (benign) tumour between the fifth and ninth thoracic vertebrae. The tumour was operated on at the same hospital, which resulted in an incomplete injury at T3; this meant the last fully functioning nerve before the cord compression was the third thoracic nerve so Mr Thomas has reduced movement and sensation in his trunk and lower limbs.

He was admitted for specialist rehabilitation at the regional spinal injury centre and made good progress. He received physiotherapy, occupational therapy and education to enable him to be as independent as possible and reduce complications. By the time he was discharged, he was able to walk with a frame and the help of one person, void on urge and perform intermittent self-catheterisation twice a day to ensure complete bladder emptying. He could open his bowels on urge with the aid of suppositories. He had not developed any pressure injuries.

After discharge, Mr Thomas was followed up at the local hospital and at the specialist centre, which offers lifelong support.

The patient’s name has been changed

important to them. This is crucial for all patients with NTSCI as it enables them to set realistic goals under the guidance of the multidisciplinary team (MDT). Regular meetings with their MDT give patients the opportunity to see their progress and take ownership of their rehabilitation.

Specialist management techniques, and their importance, should be explained to patients because they need to understand how SCC has affected their body (Van Wyk et al, 2015); this will hopefully help to reduce complications that may occur following discharge.

Nursing staff also need to give their attention to:

● Pressure-ulcer prevention;

● Bladder and bowel management;

● Pain management;

● Psychological wellbeing.

The underlying cause of the injury may also require continuous monitoring (Gupta et al, 2009).

Pressure ulcer prevention

Due to decreased sensation below the spinal cord damage and prolonged pressure over boney prominences, patients are susceptible to developing pressure ulcers (Chan et al, 2013). These can have a devastating impact on individuals living with spinal cord damage (Lala et al, 2014) and require early detection and treatment. Any mark on the skin should be kept free of pressure until resolved to avoid further deterioration and aid the healing process (Liu et al, 2014).

Pressure ulcer prevention is a lifelong requirement and should start at the time of the start at the time the NTSCI occurs. Prevention strategies include:

● Daily skin inspection;

● Pressure-relieving techniques;

● Use of specialist equipment (mattresses, cushions);

● A well-balanced diet (Sezer et al, 2015).

Bowel management

Bladder dysfunction is a common side-effect of NTSCI and results in the loss of voluntary bladder control due to central neurological damage. If not managed effectively, this can lead to:

● Incontinence;

● Urinary tract infections (UTIs);

● High bladder pressure, which in turn can cause reflux and damage to the kidneys (Afsar et al, 2013).

UTIs and urinary incontinence are two of the most common complications after NTSCI (Barclay et al, 2017).

The foremost objective of bladder management is to achieve sufficient emptying, and low-pressure urine storage and drainage (Afsar et al, 2013). Afsar et al (2013) and El-Masri et al (2012) advocated intermittent self-catheterisation as the most suitable and safest way to avoid complications.

Bowel management

Nurses must gain informed consent from patients before performing any of these bowel management interventions. NTSCI = non-traumatic spinal cord injury

Adequate bowel management is key to reduce physical complications and psychological distress. Its goal is to establish a regular and predictable pattern of emptying so patients have some control over the evacuation of stools (Pardee et al, 2012).

Table 2 outlines the elements of a regular stool evacuation programme for patients with NTSCI.

Table 2. Elements of a regular stool evacuation programme for patients with NTSCI

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Aim</th>
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<tr>
<td>Glycerine suppositories</td>
<td>Stimulate the bowel, assist colonic transit and produce a spontaneous result</td>
</tr>
<tr>
<td>Warm drink and/or food</td>
<td>Promote gastrocolic reflex and encourage stools to move through the bowel into the rectum</td>
</tr>
<tr>
<td>Digital rectal stimulation</td>
<td>Stimulate the bowel and assist colonic transit if suppositories are not sufficient</td>
</tr>
<tr>
<td>Digital removal of faeces</td>
<td>Empty the bowel to reduce risk of faecal incontinence later in the day – used if faeces remain in the rectum after use of suppositories and/or digital rectal stimulation</td>
</tr>
</tbody>
</table>

*Source: Adapted from Multidisciplinary Association for Spinal Cord Injury Professionals (2012)
Clinical Practice

Review

DRF is an integral part of their routine. It also clearly states that DRE and DRF cannot be considered abuse if a patient has given informed consent (and been assessed as having the mental capacity to make an informed decision). However, nurses should gain and document patients’ informed consent before performing evacuation and DRE (Nursing and Midwifery Council, 2018).

Pain management

Pain is another common complication and can be costly in terms of impeding return to work and social reintegration (New, 2016). After spinal cord injury, neuropathic pain can occur from damage to the neural tissues and nociceptive pain can result from damage to non-neural tissues. Both types may be present, compounding comorbidities such as insomnia, depression and anxiety (Belanger et al, 2018). It is important to complete a holistic pain assessment and work with the patient to manage their symptoms.

Psychological wellbeing

The physical changes caused by spinal cord damage often mean patients become dependent on others, even for simple tasks, and may experience an array of psychological effects, including loss of self-esteem and self-worth (Smyth et al, 2016). In patients with SCC, Smyth et al (2016) reported prevalence of the following conditions:

- Post-traumatic stress disorder: 14%
- Clinically significant anxiety: 20-25%
- Depression: 30-40%

Sadness, confusion, anxiety, fear and anger are also often seen, and can affect patients’ receptiveness to treatment (Smyth et al, 2016).

Peer support workers play an important part in helping people adjust to living with spinal cord injury (Haas et al, 2013). Patients and families can seek help from charities such as the Spinal Injuries Association (www.spinal.co.uk), while specialist spinal rehabilitation centres often have outreach teams that also offer advice and support.

Good communication

As NTSCI often arises as a secondary complication of another health issue, several specialties are often involved in a patient’s care. Good communication between health professionals, including nurses, is vital for patients to receive the treatments they need and ensure the transitions between services are smooth (Fontin et al, 2015; Tan and New, 2011).

Nurses and other health professionals also need to ensure effective and sensitive communication with patients and families, sharing information about diagnosis, treatment, medication and progress in clear and manageable ways (Protheroe and Rowlands, 2013). Patients typically retain about half the information they receive, and only half of that is estimated to be correct (Protheroe and Rowlands, 2013), so it is crucial to give them clear information and ensure it has been correctly understood.

“Patients may experience loss of self esteem and self-worth”

Conclusion

NTSCI disrupts sensory and motor function below the level of the spinal cord damage, causing physical impairment and affecting psychological wellbeing. Assessment and treatment at a specialist centre is key to maximise patient function.

References


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