The diagnosis and treatment of nonspecific neck pain and whiplash

A. BINDER

Nonspecific (simple) neck pain is the commonest cause of neck symptoms and results from postural and mechanical causes. It includes pain following whiplash injury provided there is no bony injury or objective neurological deficit. The anatomy of the cervical spine is described, with the degenerative changes that are seen in patients with nonspecific neck pain, but also occur with ageing. The poor correlation between the degree of degeneration and presence and severity of symptoms is noted. A lack of specific pathology is also a feature of whiplash. The epidemiology, clinical presentation, investigation, and complications of nonspecific neck pain are described with a discussion of the controversial aspects of natural history, prognosis and therapy. Chronic whiplash is very common in some countries, but nonexistent in other countries and the factors which might explain this difference are considered. There is a great need for better quality studies to explore pathogenesis, natural history and factors including therapy that influence outcome.

Key words: Cervical spine - Neck pain - Spinal osteophytosis - Whiplash injuries - Vehicle, motor - Multiple injuries.

Most patients who present with chronic neck symptoms fit into the category of nonspecific (simple) neck pain, having a postural or mechanical basis. Aetiological factors include poor posture, anxiety, depression, neck strain or occupational or sporting activities, but are often multifactorial and poorly understood. Where mechanical factors are prominent, the condition is often referred to as ‘cervical spondylosis’, although this term is often applied to all patients with chronic nonspecific neck pain. Pain following a sudden acceleration-deceleration injury to the neck, (‘whiplash’), is also included in this group, provided there is no fracture, dislocation or objective neurological deficit (whiplash-associated disorder grade 0 – 2). Conditions like fibromyalgia or disc prolapse are not included in this group, and will not be discussed.

Most studies of neck pain concentrate on therapy, but do not stratify for duration of symptoms or type of onset (traumatic or not), but there is some evidence that factors like these influence outcome. In practice, most studies of nonspecific neck pain are in patients with subacute (1-4 months duration) or chronic (>4 months duration) disease, with studies of acute neck pain (<4 weeks) being confined to neck pain following whiplash.

I will consider the diagnosis of nonspecific neck pain, highlighting the differences when symptoms following trauma (whiplash), and will also summarise the evidence for available therapeutic options, although therapy will be discussed in more detail in other contributions.
Functional anatomy of the cervical spine

The cervical spine is the most mobile and least stable part of the human spine, with 7 vertebrae of different shapes and sizes connected by intervertebral discs, and a complex system of ligaments and muscles, to allow a great versatility of movement. Any of these structures can be the source of pain, but degenerative changes most often start in the cervical discs and extend to surrounding structures.

The vertebral arteries pass close to the zygapophyseal joints, immediately anterior to the emerging cervical nerve roots. The preganglionic sympathetic nerve fibres run near the carotid and vertebral vessels, to synapse with the stellate, middle, and superior cervical ganglia. The postganglionic sympathetic fibres then separate into 3 directions: some fibres go to the upper limbs to provide autonomic control of circulation, sweating, and proprioception; other fibres re-enter the spinal cord via the intervertebral foramina to synapse in the vestibular apparatus, cerebellum, thalamus, and hypothalamus; and some fibres pass upward with the vertebral and carotid arteries to the brain. Involvement of the vertebral arteries and sympathetic nerves in the degenerative process may explain the wide range of the pain and many unusual features associated with pathology of the cervical spine.

There is very little room in the spinal canal between C4 and T2, due to the enlargement of the cord in this region. As degenerative changes are also most frequent and severe between C5 and T1, compression of the cord usually develops in this region (see myelopathy). Inflammatory arthropathies, in contrast, have a predilection for involvement of the atlantoaxial and upper cervical spine. Minor congenital spinal abnormalities are common and increase the risk of early degenerative change.

The anterior and posterior nerve roots from C4 to T1 exit through the dural root sleeves, and traverse the intervertebral foramina. They then merge to form the brachial plexus, which lies between the clavicle and first rib, in close proximity to the subclavian vessels. The neurovascular bundle is susceptible to compression at various sites in the thoracic outlet, which lies between the neck and axillae. Cervical nerves have a dermatomal representation, which explains the radicular pattern of symptoms in the upper limbs where there is impingement of individual nerve roots (see radiculopathy). Nonspecific neck pain complicated by myelopathy or radiculopathy (nerve root compression) needs to be differentiated from other mechanical lesions or primary neurological diseases.

Pathophysiology of nonspecific neck pain

Nontraumatic causes

Some patients show degenerative changes predominantly in the cervical discs with osteophyte formation and involvement of adjacent soft tissue structures (Figure 1). However, many people over the age of 30 years, show similar degenerative changes on plain X-rays, and even MRI scanning of the cervical spine, and the boundary between normal ageing and disease is difficult to define. There is a very poor correlation between symptoms and radiological findings, and the diagnosis is often made on clinical grounds alone.

Whiplash

Symptoms must follow a sudden acceleration-deceleration of the neck, as occurs in road traffic or sporting accidents. While symptoms are often very severe, the source of the pain is usually uncertain. In most patients with whiplash, no specific pathology is identified on detailed clinical or radiological investigation. While soft tissue injury is considered as the most likely explanation for the symptoms, it is difficult to confirm even using MRI scanning. In some patients with chronic whiplash, zygapophyseal joint abnormality, or brachial plexus involvement has been identified. It is not clear whether pre-existing degenerative change influences outcome.

Epidemiology of nonspecific neck pain

Epidemiological studies of neck pain are often based on questionnaires and surveys, which may overestimate the frequency of the condition. Despite the methodological difficulties, studies do provide evidence that nonspecific neck pain including whiplash place a heavy burden on individuals, employers, and health care services.

Nontraumatic causes

About 2/3 of the population will experience neck pain at some time in their lives, with prevalence
being highest in middle age. In a general practitioners (GP) survey of adults in the UK, about 25% of women and 20% of men reported neck pain at that time of the survey.11 Another UK survey also found 18% of 7669 adults had neck pain at the time of the survey, but when symptomatic people were questioned one year later (58% responded), half still had symptoms.12 A Norwegian survey of 10 000 adults also reported that 34% of responders had experienced neck pain in the previous year.13 Neck pain is second only to back pain in frequency of musculo-skeletal consultation in primary care. In the UK, 15% of hospital-based physiotherapy is for neck pain14 and in Canada 30% of chiropractic referrals are for this cause.15

Whiplash

Although whiplash injury is very common throughout the world, the incidence of reported symptom, and patients who go on to chronic disability or seek compensation varies greatly between countries and even between different regions or social groups within the same country. There is no consistency in the literature about the epidemiology and natural history of whiplash, partially because of the poor quality of studies,1,16 but, more specifically, because of the complex interactions between the individual, legal, economic, and societal factors, which may influence presentation and outcome.1,16 In some countries, like Lithuania and Greece where there is no litigation or compensation culture, chronic whiplash is very rare, and outcome is universally favourable. A prospective study in Lithuania (210 patients followed up for one year),17 reported neck pain and/or headache in 47% of patients, but symptoms only lasted for a median of 3 days, and settled in 17 days, with no patients developing chronic whiplash. At 1 year, the prevalence of chronic neck pain was the same as for age and sex matched controls. Another prospective study in Greece (180 patients followed for 6 months),18 showed a similar favourable outcome with full recovery in 90% of
patients within 4 weeks with the remaining symptoms being trivial and resolving soon thereafter. Again, no patients developed chronic whiplash. In contrast, in countries like the USA, Canada, Netherlands, Australia and the UK, much higher proportions of patients develop chronic whiplash and suffer prolonged disability. In a study in Quebec (cohort of 2,627 patients who developed whiplash in 1987 with follow-up for 7 years) the median time to recovery was 32 days, with only 22% being asymptomatic within a week. In this study, 12% had still not recovered by 6 months and 3% by a year. The quoted incidence for claims for compensation for whiplash per 100,000 inhabitants in the literature vary widely being 0 in Lithuania and Greece, 70 in Quebec\(^1\), 188-325 in Holland\(^20\) and 417 in Saskatchewan before a change in the compensation laws in 1995, when the level dropped to 296 per 100,000 within a year. Internationally, whiplash lasting for over 6 months varies between 2% and 58%\(^16,21\), but typically lies between 20% and 40%\(^22\).

**The diagnosis of nonspecific neck pain**

Nonspecific neck pain is usually diagnosed on clinical grounds alone, provided there are no features ('red flags') to suggest more serious conditions.

**Symptoms**

**Nontraumatic causes**

The main symptom is pain in the cervical region radiating to the occiput, nuchal muscles, shoulders and upper limbs. Retro-orbital and temporal pain suggests referral from the upper cervical levels, (C1–C3) and can mimic giant cell arteritis. Some patients develop anterior chest pain, which can resemble coronary ischaemia.\(^23\) Stiffness can be reversible or irreversible and is usually (but not always) associated with pain. Numbness, tingling or weakness in the upper limbs when present, is ill-defined, unless there is nerve root entrapment when it can follow a radicular pattern (see radiculopathy). Dizziness or poor balance may result from vertebral artery involvement or irritation of the sympathetic nerves and is usually exacerbated by neck movement when due to this cause. Other less common symptoms include dysphagia (due to large anterior osteophytes), dyspnoea, or triggering of migraine.

**Whiplash syndrome**

In whiplash, symptoms may be delayed by hours or even days after the injury. All the symptoms described above can occur, but the most common are neck pain (88-100%) and headache (54-66%). Other more diverse features include low back, other spinal pain, fatigue, dizziness, paraesthesia, nausea and jaw pain. Many patients also report anxiety, depression and poor concentration.\(^21,24\)

---

**Table I.** Differential diagnosis of nonspecific neck pain.

<table>
<thead>
<tr>
<th>Category</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft tissue lesions</td>
<td>acute neck strain, acute torticollis</td>
</tr>
<tr>
<td>Fibromyalgia and psychogenic causes</td>
<td></td>
</tr>
<tr>
<td>Mechanical lesions</td>
<td>disc prolapse, diffuse idiopathic skeletal hyperostosis (DISH)</td>
</tr>
<tr>
<td>Inflammatory</td>
<td>rheumatoid, ankylosing spondylitis, polymyalgia rheumatica</td>
</tr>
<tr>
<td>Metabolic</td>
<td>Paget’s disease, osteoporosis, gout, pseudo-gout</td>
</tr>
<tr>
<td>Infective</td>
<td>osteomyelitis, TB</td>
</tr>
<tr>
<td>Malignancy</td>
<td>primary tumours, secondary deposits, myeloma</td>
</tr>
<tr>
<td>Adjacent pathology</td>
<td>shoulder or acromioclavicular disease</td>
</tr>
</tbody>
</table>

**Table II.** ‘Red Flag’ features and diagnoses they suggest.

<table>
<thead>
<tr>
<th>Category</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignancy, infection, inflammation</td>
<td></td>
</tr>
<tr>
<td>Fever, night sweats</td>
<td></td>
</tr>
<tr>
<td>Unexpected weight loss</td>
<td></td>
</tr>
<tr>
<td>History of inflammatory arthritis, malignancy, infection, TB, AIDS, drug dependency, or immunosuppression</td>
<td></td>
</tr>
<tr>
<td>Excruciating pain</td>
<td></td>
</tr>
<tr>
<td>Cervical lymphadenopathy</td>
<td></td>
</tr>
<tr>
<td>Exquisite tenderness over vertebral body</td>
<td></td>
</tr>
<tr>
<td>Intractable night pain</td>
<td></td>
</tr>
<tr>
<td>Myelopathy</td>
<td></td>
</tr>
<tr>
<td>Gait disturbance and clumsy hands</td>
<td></td>
</tr>
<tr>
<td>Objective neurological deficit - upper motor neuron signs in the legs and lower motor neuron signs in the arms (see text)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
<tr>
<td>History of severe osteoporosis</td>
<td></td>
</tr>
<tr>
<td>History of neck surgery</td>
<td></td>
</tr>
<tr>
<td>Drop attacks especially when moving the neck</td>
<td></td>
</tr>
<tr>
<td>Intractable or increasing pain</td>
<td></td>
</tr>
<tr>
<td>Following whiplash</td>
<td></td>
</tr>
<tr>
<td>Midline cervical tenderness</td>
<td></td>
</tr>
<tr>
<td>Loss of consciousness</td>
<td></td>
</tr>
<tr>
<td>Intoxication by alcohol or drugs</td>
<td></td>
</tr>
<tr>
<td>Objective neurological deficit</td>
<td></td>
</tr>
<tr>
<td>Distracting injury</td>
<td></td>
</tr>
</tbody>
</table>

---

82 EUROPA MEDICOPHYSICA March 2007
**Signs**

Tenderness due to degenerative disease is poorly localized and of variable severity, being more evident in the lower cervical regions (C5-C6), where disc degeneration is more evident. Exquisite localized tenderness over a vertebral body, especially in a patient with features of systemic upset, is more suggestive of osteomyelitis or malignancy, and need further investigation for more serious pathology. Midline tenderness following whiplash also suggests a need for an X-ray to exclude a fracture or dislocation. Limitation of movement (forward flexion, backward extension, lateral flexion and rotation to both sides) is common with ageing, and often correlates poorly with the severity of the pain. Neurological abnormalities should always be sought in the upper and lower limbs, but are vague and ill-defined unless complicated by myelopathy or radiculopathy, or due to other causes like thoracic outlet obstruction or brachial plexus disease.

**Conditions that need to be differentiated from nonspecific neck pain**

The most important conditions, which need to be differentiated from nonspecific neck pain are shown in Table I. Fibromyalgia and psychogenic conditions cause more diverse symptoms with sleep disturbance, tender ‘trigger’ points and more prominent psychological abnormalities. Most of the other conditions listed in the table, are suggested by ‘red flag’ symptoms (Table II), which indicates the need for more detailed investigation.

**Investigation of patients with suspected nonspecific neck pain**

The vast majority of patients do not require further investigation, with the diagnosis being made on clinical grounds alone.

Plain radiographs of the cervical spine may show a loss of normal cervical lordosis suggesting muscle spasm, but most other features of degenerative disease (Figure 1) are common in asymptomatic people, and correlate poorly with clinical symptoms. Following whiplash injury, radiography is required only if fracture or subluxation is suspected. Clues to the need for radiology are painful distracting type of injury, loss of consciousness, intoxication by alcohol or other substances, or where there is midline cervical tenderness or focal neurological deficit.

MRI scan of the cervical spine is the investigation of choice where more serious pathology is suspected, but normal people also show important pathological abnormalities on MRI, so the scans need to be interpreted with care. As already mentioned, MRI scan is rarely helpful following whiplash injuries, and may reinforce illness behaviour and so delay recovery.

Patients who are systemically ill or have features suggesting more serious pathology (Table II) often require additional investigations such as full blood count, sedimentation rate, C-reactive protein, protein electrophoresis, and occasionally electrodiagnostic studies to exclude other pathologies.

**Complications of nonspecific neck pain**

Nonspecific neck pain can be complicated by radiculopathy or myelopathy, although similar symptoms can result from cervical disc prolapse, plexopathy, motor neurone disease, or other causes, and MRI scanning, and if necessary, electrodiagnostic and other investigations may be required to exclude other diagnoses. Neurological complications can occur in established cervical spondylosis or can be the presenting feature of the disease.

Radiculopathy (nerve root compression) complicating nonspecific neck pain usually affects the C5 to C7 levels, although higher levels can also be affected. Neurological features follow a segmental distribution in the upper limb with sensory symptoms (shooting pains, numbness, hyperaesthesia) being more common than weakness. The reflexes are usually diminished at the appropriate level (biceps [C5/6], supinator [C5/6] or triceps [C7]). Figure 2 shows the dermatomal distribution of nerves arising in the cervical spine.

Myelopathy due to nonspecific neck pain often develops insidiously and presents with paraesthesia or clumsiness of the hands and/or gait disturbance due to sensory ataxia or spastic paraparesis of the lower limbs. Bladder dysfunction is uncommon. On examination of the upper limbs there may be an increase in tone with increased tone in finger flexors. The lower limbs usually show an increase in tone with spasticity, but little true weakness. Tendon reflexes are very characteristic, with reduced or even inverted biceps or supinator jerks (finger flexion...
instead of the normal biceps or supinator jerk), with an increase in triceps, finger jerks and all lower limb reflexes. Plantar responses are up-going, with ankle clonus and a positive Hoffman’s sign (flexion of terminal phalanx of thumb and second and third phalanges of the other fingers when one of the middle fingertips is flicked). Sensory changes are variable, with loss of vibration and joint position sense in the hands being more evident than in the feet. Figure 3 shows an MRI scan with multiple spondylotic bars, and myelopathic changes in the cervical cord at the C5/C6 level.

Natural history of nonspecific neck pain and whiplash and factors associated with chronic disability

Nontraumatic causes

Nonspecific neck pain usually resolves within days or weeks, but can recur or become chronic. Once pain becomes persistent, outcome is more unpredictable, and there is little consistency in the literature regarding the duration of symptoms and factors that influence outcome. A systematic review of the clinical course and prognostic factors in ‘nonspecific neck pain’, found little consensus as to outcome or relevant prognostic factors, although this was based on poor quality studies. The systematic review found evidence that in patients with chronic pain treated in secondary care or an occupational setting, 20-78% (median 54%) of patients remained symptomatic, irrespective of the therapy given. Six of the included studies documented prognostic factors, and the severity of pain at presentation was the best predictor of a poor outcome, although previous episodes of neck pain were also associated with a less favourable outcome. Three subsequent studies also considered the factors at presentation, which might influence outcome at one year. One population cohort study of 1359 patients with chronic neck pain found 48% of patients were still symptomatic at one year, with an unfavourable outcome being associated with older age, being off work, or having concomitant back pain. The first therapeutic study (183 patients with neck pain for at least 2 weeks), found 37% still had pain at one year, with older age, concomitant low back pain or headache associated with a less favourable outcome, although the predictive power of the study was very weak. The second therapeutic study (193 patients with chronic pain), found the severity and duration of symptoms at presentation, and patient wellbeing were of relevance. Patients with chronic spinal conditions were also found to have other chronic pain syndromes (69%), chronic physical conditions (55%) or psychological problems (35%).

Neck pain with neurological complications

Many of the patients with neurological abnormality as a result of nonspecific neck pain will require MRI scanning of the cervical spine at an early stage, particularly if there is progressive myelopathy or intractable pain. Radiculopathy generally has a favourable outcome, although recovery is slow. The result of decompressive surgery for myelopathy complicating nonspecific neck pain is often disappointing. While the rate of progression of the neurological deficit may be slowed by the surgery, the lost function may not recover, or symptoms may progress at a later date. The poor outcome following surgery may reflect the irreversible damage to the cervical cord (Figure 2) or compromise to the vascular supply to the cord immediately or subsequently.

Whiplash

The prognosis for whiplash is also considered to be favourable, but shows great variability as to the frequency, severity and duration of disability. This variability in outcome is at least in part related to the culture of litigation and compensation, but this cannot explain all the differences, particularly within the same population. Two comprehensive systematic reviews found little consistency as to factors influencing outcome.

Litigation and compensation

The marked discrepancy in chronic whiplash in different countries seems to reflect differences in the legal and compensation systems, although the process of litigation rather than the desire for financial gain, may explain these differences. Two studies, one in Saskatchewan, Canada and the other in Victoria, Australia demonstrated the impact of a change in the legal system on the incidence and duration of chronic disability. In Saskatchewan, the incidence of claims was 417 per 100 000 in the 6 months before a
change in the compensation system in 1995 and 296 per 100 000 a year after,\textsuperscript{33} and in Victoria, there was a 68% decrease over the same period after the change in the law in 1987.\textsuperscript{34}

Societal factors

How societal factors influence outcome are complex and poorly understood, but an example of their relevance was provided by a retrospective review of self-reported outcome of whiplash in physicians and nonphysicians working at a university hospital in the USA. In this study, both groups were involved in similar numbers of motor vehicle accidents, but while 9% of physicians developed chronic whiplash, 33% of nonphysicians developed prolonged disability.\textsuperscript{35}

Other factors

Systematic reviews of prognostic factors in whiplash\textsuperscript{1, 16, 21} found conflicting evidence for physical factors like age, restricted range, pre-existing psychological problems, nervousness and crash-related factors. The most consistent physical factors associated with an unfavourable outcome from the systematic reviews and subsequent studies were severity of pain, headache and disability at presentation.

Impact of treatment on nonspecific neck pain

Most mechanical neck pain will respond to conservative measures, but the optimal therapeutic approach for uncomplicated neck pain has yet to be established. Few modalities of treatment have been assessed in high quality randomised studies, but I will try to summarise the best available evidence for the most commonly used modalities.\textsuperscript{36}

Pragmatic (untested) measures

It is not currently possible to treat neck pain solely on the basis of proven evidence-based measures, as this does not address the postural aspects, which are often important in causing or maintaining neck and other spinal symptoms. Postural factors in day-to-day activities, work or sport should be identified in each individual, and if possible eliminated, although the importance has not been studied. Too many pillows at night are another important cause of neck pain, and a reduction to one pillow will help many patients. Stress management, Yoga, Pilates and the Alexander Technique all improve neck posture, but there therapeutic value has not been assessed.

Analgesics, anti-inflammatory drugs and low dose tricyclic antidepressants are all used empirically, but have not been subjected to controlled study.

Treatment of acute neck pain to prevent chronic disability

Studies of the treatment of acute neck pain are mainly in patients suffering whiplash injuries, and it is unclear whether the data also applies to nontraumatic causes. Two systematic reviews considered acute neck pain not due to whiplash, and reported limited evidence of benefit for manipulation or mobilisation\textsuperscript{37, 38} from small poor quality studies. There is no evidence for nonsteroidal anti-inflammatory drugs (NSAIDS) or analgesics and weak evidence for muscle relaxants, but with a high incidence of unpleasant side effects like drowsiness.

Treatment of chronic neck pain

There is moderate evidence from randomised control trials (RCTs) identified by systematic reviews\textsuperscript{36, 39}, that a variety of exercise regimes, are more effective than ‘usual’ care (analgesics, NSAIDS, or muscle relaxants),\textsuperscript{41, 42} or stress management,\textsuperscript{43, 44} although not all studies have found exercise beneficial.\textsuperscript{45}

RCTs included in systematic reviews of manual therapies (mobilisation physiotherapy and/or manipulation),\textsuperscript{36, 38, 39, 46-48} provide limited evidence that it is more effective\textsuperscript{49, 50} than less active treatments, although manipulation has occasionally been associated with serious neurological complications, (estimated at about 5-10/10 million manipulations).\textsuperscript{51}

When mobilisation, manipulation and exercise were compared to each other,\textsuperscript{52} or where mobilisation was compared to manipulation,\textsuperscript{53, 54} they were found to be equally effective. When the combination of exercise and manipulation was compared to either modality alone, the combination was found to be more effective at 3 months,\textsuperscript{55} but with no difference to exercise alone at 1 and 2 years.\textsuperscript{56} In contrast, a pragmatic study
found no advantage at 6 weeks or 6 months by the addition of manual therapy (63% having mobilisation physiotherapy) or heat (shortwave diathermy) to exercise and advice.57

Systematic reviews of weak RCTs provided insufficient evidence about the effects of acupuncture,58 or traction,59 compared to a range of other treatments. The addition of psychotherapy techniques like cognitive behavioural therapy also added little to physical or mechanical therapies alone.60

**Treatment of neck pain complicated by radiculopathy**

Radiculopathy generally has a favourable outcome without surgery, and there is increased interest in conservative therapies particularly for high-risk patients who are neurologically stable. At present, there are only a few small poor quality RCTs of cervical epidural injection,61 or other conservative measures,62 in these patients. Two small studies compared epidural injection to placebo, and found the epidural injections slightly more effective,63, 64 but the difference did not reach significance. Epidural injection in the cervical region is more invasive than in the lumbar region, and should only be considered in patients with intractable pain or radiculopathy where surgical intervention is not considered an option.64 One RCT in patients with cervical radiculopathy, compared surgical intervention to physiotherapy or immobilisation in a collar. While the surgical group had less pain at 3-4 months, there was no difference in outcome between the 3 treatment groups at one year.65

**Treatment of acute whiplash to prevent chronic disability**

RCTs identified by systematic reviews 1, 22, 36, 66 provide moderate evidence that early mobilisation physiotherapy 67-70 or advice to “act as usual” 71 are more effective than immobilisation or less active therapies in hastening recovery and reducing chronic disability, although one study did not confirm this benefit.72 There is less evidence of efficacy for home exercise regimes,73 pulsed electromagnetic field therapy 74 and multimodal therapy.75

**Treatment of chronic whiplash**

Few RCTs have considered treatment for chronic whiplash and many people with whiplash are included in general RCTs of chronic nonspecific neck pain. The only therapy with some promise is percutaneous radiofrequency neurotomy, although it has only been subjected to limited study.6 There is very little evidence with regard to efficacy of other physical or mechanical therapies in chronic whiplash.

**Discussion**

Nonspecific neck pain is a common cause of disability, and places a heavy burden on individuals, employers and society. Despite its frequency, there remains a poor understanding of aetiology, pathophysiology, outcome and prognostic factors, and these require further study in larger well-designed prospective studies. Many available systematic reviews 40, 47 and studies of neck pain combine data from patients with chronic neck pain due to traumatic or nontraumatic causes, but this may hide important differences, such as the influence of compensation laws on outcome. Other subgroups, like occupational neck pain 76 also appear to have different dynamics which may influence outcome.

Degenerative change in the cervical spine occurs as part of the normal ageing process, and its presence and severity correlates very poorly with symptoms of neck pain. In most patients with nonspecific neck pain, the aetiology of the symptoms is poorly understood, a discrepancy which is even more apparent in whiplash syndrome.

Nonspecific neck pain is diagnosed on clinical grounds alone, but ‘red flag’ symptoms must also be sought to determine which patients require further investigation with MRI scan and blood tests. MRI scan is the investigation of choice in patients suspected of having more serious pathology, but the findings need to be interpreted with care, as significant MRI abnormalities are common in asymptomatic people.5

In patients with neck pain, clinical assessment needs to include a detailed neurological examination of upper and lower limbs to recognise the presence of complications like myelopathy, which often develop insidiously and can be mistaken for the effects of ageing or primary neurological disease. Neurosurgical intervention is often required for patients with
myelopathy, but the results can be disappointing, and conservative approaches need to be studied especially in high risk patients. In patients with radiculopathy, the prognosis without surgical intervention is good, but there have been very few studies which have evaluated the role of epidural injection, or conservative approaches.

The prognosis for acute neck pain is very good, but becomes more unpredictable once it becomes chronic. This difference is even more evident following whiplash injury, although the discrepancies between different populations and reasons for these differences need further study. While several studies have suggested that the compensation culture affects outcome, the dynamics of this and other societal factors also need further study.

There have been some higher quality RCTs of therapy in patients with nonspecific neck pain, which have suggested that exercise, and manual therapy (mobilisation and manipulation physiotherapy) and conservative approaches. Many aspects regarding aetiopathogenesis and treatment effectiveness of individual treatment modalities. Standardised protocols should clarify efficacy and cost-effectiveness of these modalities has not been studied. One high quality study suggested additional benefits if exercise was used in combination with mobilisation or manipulation and this approach needs further study. There is some evidence that early mobilisation physiotherapy or early return to normal activities following whiplash injury hastens recovery, and there may be a window of opportunity to prevent the condition from becoming chronic.

The most commonly used first line therapies like analgesics, anti-inflammatory agents, tricyclic antidepressants, stress management, and postural advice have not been studied. Other modalities like acupuncture, traction, electrotherapy, and psychotherapy are of uncertain value and also need further assessment.

The lack of consistency in study design, patient population, outcome measures and durations of follow-up and the use of multiple interventions in the same study complicate comparison between studies. Large well-designed randomised studies using standardised protocols should clarify efficacy and cost-effectiveness of individual treatment modalities.

Nonspecific neck pain including whiplash is a very common cause of disability, but there remain many aspects regarding aetiopathogenesis and treatment which remain to be explored. If the factors that influence progression from acute to chronic pain are better understood, it may be possible to reduce the frequency and severity of disability in a condition with a major impact on individual patients and society.

Conclusions

I have outlined the clinical presentation of nonspecific neck pain and whiplash with complications, differential diagnoses, and features which alert the clinician to a need for further investigation. I have also discussed the state of the evidence for the most commonly used therapies, and highlighted the shortcomings of our current knowledge.

References


