Acute neck pain following a car accident

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The immediate management and investigation of an acute pain presentation in general practice is discussed in this article.

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Tania, a 33-year-old woman, presents to your suburban general practice requesting a medical certificate for sick leave from her part-time job as an accountant. She is wearing a soft immobilisation collar and complains of severe neck pain following a motor vehicle accident a week ago. Her previous medical history is unremarkable.

What further information is required to assess Tania?

A detailed history including the circumstances of the injury, a pain history and screening for significant neck pathology, as well as a full medical, psychological, medication and social history is required to assess Tania. It is also important to assess her expectation of recovery with a question such as, 'Do you think you are going to get better soon?' A negative expectation of recovery is associated with ongoing neck pain and disability so should prompt further psychological assessment and more frequent follow up.[1] This should be followed by a thorough examination, including of the cervical spine and neurological system and consideration of investigations.

Many factors relating to motor vehicle accidents, including seat belt use, the speed of collision, patient position in the vehicle and the direction of impact, are not of any prognostic value.[1] The patient's self-rated collision severity is, however, a weak predictor of poor recovery.[1] Of note, the mechanism of injury is an important component of the extremely sensitive Canadian C-spine rule in determining whether or not radiological investigation is required (flowchart).[2]

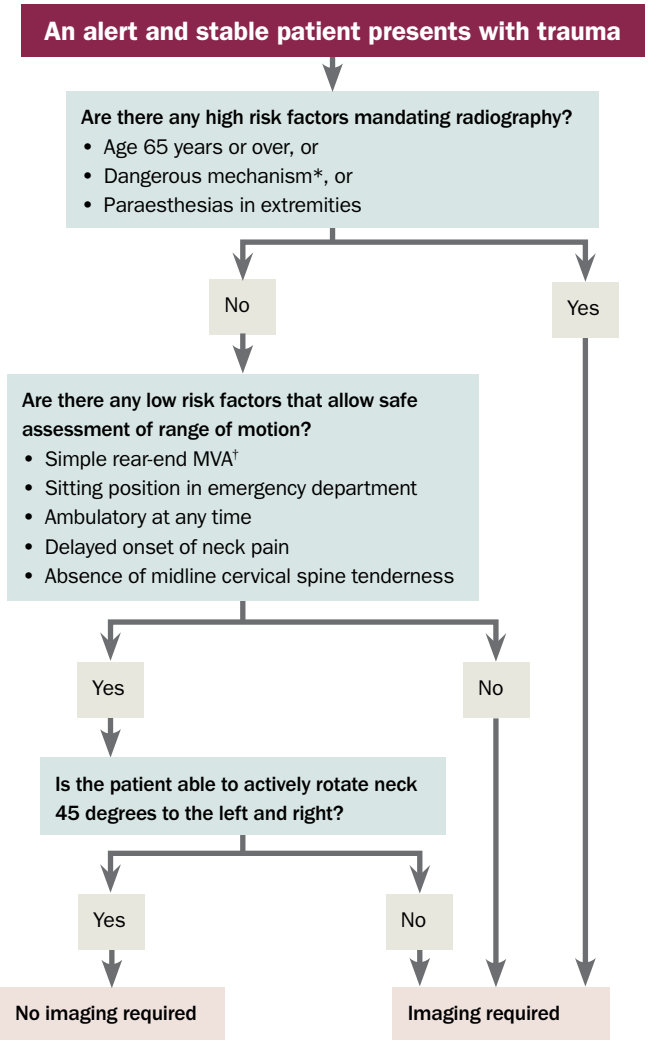
Evaluation of Tania's neck pain should include the location, radiation, intensity, character, associated features and aggravating and relieving factors. It is also important to determine if this pain has any negative effects on her functioning, including mood, sleep, activities of daily living and her occupational, social and recreational functioning. A well validated questionnaire that assesses these factors is the Neck Disability Index (NDI).[3]

There is strong evidence that a high initial pain intensity (Visual Analogue Scale [VAS] score of >5.5/10) and a high initial disability (NDI score >29%) are the most significant predictors of persistent neck pain and disability.[4,5]

As Tania presents with acute spinal pain it is important to screen for serious pathology. 'Red flag' conditions (and their risk factors or features) include: inflammatory arthropathy (fever, anorexia, fatigue, peripheral joint arthropathy), infection (fever, intravenous drug use, immunosuppression), neoplasia (past history of cancer), fractures and/or ligamentous injury (older age, long-term corticosteroid use, severe trauma, focal neurological deficit) and myelopathy (gait disturbance, upper limb lower motor neuropathy and lower limb upper motor neuropathy).[6,7] Clinical suspicion of such pathology warrants relevant blood tests and advanced radiological investigation such as CT and/or MRI scans.

Tania was involved in a low-speed rear impact collision that caused only minor panel damage to her car. She self-extricated and initially felt incredibly shaken but physically fine. However, by the time the police arrived she had developed severe mechanical neck pain (VAS score of 8/10) so she was sent to the local emergency department. Tania shows you a discharge summary outlining a thorough history that excludes features of red flags. It also documents a complete neurological examination that did not identify any abnormalities except a reduced active range of motion of the cervical spine. Plain films of the cervical spine show only minor degenerative changes.

Canadian C-spine rule for determining the risk of cervical spine injury[1]



* Dangerous mechanisms include: fall from >1 metre or five stairs, axial load (e.g. driving), MVA >100 km/h, rollover or ejection from vehicle, bicycle collision. † A simple rear-end MVA excludes being pushed into oncoming traffic, being hit by a bus or a large truck, a rollover, and being hit by a high-speed vehicle.
Abbreviation: MVA = motor vehicle accident.

Over the past week Tania's symptoms have remained stable and she expresses concern that they will never get better. She has not attended work nor worked from home because she refuses to drive and her neck pain is limiting her capacity to concentrate and read. She is troubled by the fact that her neck pain is preventing her from picking up her 2-year-old son and that she needs her husband's help to wash her hair. Otherwise she is euthymic and her sleep is only mildly impaired in onset with the assistance of simple analgesics. You calculate her NDI to be 42% (21/50).

What is the diagnosis?

Tania has acute grade 2 whiplash-associated disorder (WAD) with multiple early signs of a poor prognosis, including a negative expectation of recovery and both a high initial VAS and NDI.

The Quebec Task force states that 'whiplash is an acceleration deceleration mechanism of energy transfer to the neck. It may result from… motor vehicle collisions…The impact may result in bony or soft tissue injuries (whiplash injury), which may in turn lead to a variety of clinical manifestations (Whiplash-Associated Disorders)'.[8] Clinical classification of grades of WAD, provided by the Quebec Task force, is based on the presence of neck complaints, neck musculoskeletal signs, neurological signs and fracture or dislocation (Table).[1] WAD can be further classified based on the number of weeks postinjury: acute (<12 weeks) and chronic (>12 weeks).[9]

WAD is a common and costly condition. In North America and Western Europe, the prevalence of WAD has been reported at three per 1000 people, with the annual economic cost estimated at US$3.9 billion and €10 billion, respectively.[10] In Australia, WAD comprises approximately 75% of all survivable road crash injuries and cost New South Wales approximately $1.5 billion in compulsory third-party claims from 1989 to 1998.[9] This high cost is associated with fact that about 50% of patients report pain and disability one year after their injury.[9,11,12]

What is the best initial management of acute WAD?

Tania should be educated about the diagnosis and reassured that serious pathology has been effectively ruled out. She should be advised that resumption of her usual activity is important as restriction of activity may delay recovery. As such her request for a medical certificate should be negotiated so as to minimise her absence from work. Tania should also be advised to stop using the immobilisation collar.

There is strong evidence that advice to maintain usual activity and undergo neck exercise programs are both effective in reducing the severity and duration of neck pain, range of motion deficits and disability.[1,9,10,13] There is also strong evidence that neck immobilisation collars should be avoided as they are ineffective and may impede recovery.[1,9,13]

The best approach to effectively educate patients about WAD and advise them to maintain usual activity is currently not very clear. A recent Cochrane review concluded that 'simply providing oral/written information or advice may not provide true therapeutic patient education'.[14] Interestingly, it did identify moderate quality evidence in support of an educational video.[14]

Consensus guidelines recommend neck-specific exercises including active range of motion, low load isometric, postural endurance

and strengthening exercises.[1] High quality trials evaluated various combinations of general and neck-focused strengthening, endurance training, stretching, functional exercises and aerobic exercises.[13] Currently, it is not clear which exercise is actually best and there is strong evidence that there is no significant difference between neck-specific exercises, active range of motion mobilisation alone, general exercise and activity, and advice to maintain usual activity.[9,13]

Tania should be referred to a well-regarded local physiotherapist to help her develop an individualised general and neck-specific exercise program. Efficacy of exercise programs can be optimised if they involve: individual instruction, direct supervision of exercises, graded activity (increasing activity levels in a time contingent manner), a home exercise program and adherence strategies (including education, positive reinforcement, goal setting and an exercise contract).[15] Aggressive neck strengthening should be avoided because there is moderate evidence of adverse long-term effects on pain and functional recovery.[13]

There are very few trials of medication therapy in managing acute WAD.[9] Consensus guidelines consider analgesics appropriate early in the management of acute WAD given the potentially negative impact of higher initial pain scores.[1] Regular paracetamol is an appropriate first-line agent then, if ineffective, an additional NSAID could be used.[16] Oral opioids may be necessary for severe acute musculoskeletal pain but the ongoing need for such agents should be regularly reviewed.[16] Anticonvulsants, antidepressants and muscle relaxants are not recommended.[1,16] Any medication should only be continued if there is empirical evidence of benefit (at least 10% improvement on VAS and NDI).[1]

Interventional management of acute WAD, including botulinum toxin injections, corticosteroid injections, acupuncture and cervical manipulation, is not recommended due to a lack of efficacy or evidence.[1,17,18]

Regular review at least every three weeks is recommended to evaluate Tania's progress.[1]

You review Tania's progress three weeks after the motor vehicle accident. She no longer wears the immobilisation collar and has visited a physiotherapist a few times but has not done any exercises at home 'because they hurt too much'. Despite regular paracetamol and ibuprofen her neck pain remains stable (VAS score of 8/10) and her reduced neck active range of motion is similar to your previous examination. Her sleep is disturbed by frequent nightmares related to her accident and her mood is generally low as she rarely leaves the house because of her refusal to enter a car. Tania's NDI has increased to 48% (24/50). Tania has still not returned to work as she believes she is unable to work while her symptoms persist at the current level. She requests stronger analgesic medication.

Table. Quebec Task Force classification of grades of WAD[1]

Grade	Classification
0	No complaint about the neck No physical sign(s)
I	Complaint of neck pain, stiffness or tenderness only No physical sign(s)
II	Neck complaint AND musculoskeletal sign(s) Musculoskeletal signs include decreased range of movement and point tenderness
III	Neck complaint AND neurological sign(s) Neurological signs include decreased or absent tendon reflexes, weakness and sensory deficits
IV	Neck complaint AND fracture or dislocation

How would you manage this request?

Tania expressed intrusive, avoidance and negative mood symptoms, which might suggest post-traumatic stress disorder (PTSD).[19] It is important to identify PTSD as there is strong evidence that early symptoms of PTSD are a negative prognostic indicator for WAD.[20] The Impact of Event Scale (IES) is a well validated self-assessment tool for detecting PTSD, and it is recommended that all patients with WAD are screened for PTSD at weeks three and six.[1,21,22] An IES of more than 23 should prompt referral of the patient to a specialist clinical psychologist for trauma-focused cognitive behavioural therapy (CBT).[23] General physical activity should also be encouraged as this is effective for both PTSD and depression.[24] Selective serotonin reuptake inhibitors may be considered in people that do not respond to CBT.[25]

There is a strong association between PTSD, opioid use and opioid misuse.[26] Caution should be taken in prescribing opioids for Tania and recommendations such as that produced by the Faculty of Pain Medicine should be followed.[27] As mentioned earlier, this prescription should be regularly reviewed and only be continued if there is empirical evidence of benefit (at least 10% improvement on VAS and NDI).[1]

Education and reassurance regarding WAD should continue to be provided to Tania. Advice to resume normal activity and encouragement to maintain her relationship with the physiotherapist and to participate in regular and graded neck-specific and general exercises should also continue to be provided.

Given Tania's evident lack of response, re-evaluation of her management should be considered with referral to a specialist WAD clinician such as a pain medicine specialist.[1] This can serve to reinforce the education, reassurance and advice to resume normal activity already provided to Tania. Also, pain medicine specialists often have a working relationship with specialist physiotherapists who can provide additional CBT to Tania's exercise program for which there is moderate evidence of an added benefit in WAD.[15] Maximising the efficacy of Tania's exercise program is important as this is the most effective intervention should Tania's symptoms persist to become chronic WAD.[13] PMT

References

A list of references is included in the website version of this article (www.painmanagementtoday.com.au).

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