Treatment strategies for chronic cases

Dr. Susan M Lord*

Preface

This paper addresses the treatment of chronic somatic pain after whiplash injury; that is, pain referred to the head, neck, shoulder girdle and upper limb from somatic structures. There is a dearth of literature regarding the treatment of other chronic whiplash-associated symptoms such as dizziness, visual disturbance, and cognitive impairment, which precludes a literature synthesis. Nor will this paper address the treatment of radicular pain, for the diagnosis and treatment of true radiculopathy generate little controversy, and are adequately covered in the neurological and neurosurgical literature.

The majority of patients who report acute whiplash-associated disorder (WAD) are asymptomatic 12 months later. Only 15-20% of patients remain symptomatic, and only about 5% are severely affected (1). However, it is the latter group that constitutes the major burden to insurers and to health care resources. The most cost-efficient treatment strategy for any condition is one that has perfect efficacy, that is, one that completely relieves the condition and prevents its sequelae. The challenge is to develop such a strategy for chronic pain after whiplash.

The treatment strategy should be based on scientific evidence of the highest quality. Unfortunately, only one Grade I study has been

attempted (2). The Quebec Task Force on WAD undertook a systematic review of the pre-1994 literature addressing WAD. Of 10,382 potentially relevant articles, only 1,204 met preliminary screening criteria, and only 62 were both relevant and scientifically acceptable. With respect to treatment of chronic cases, there was only one Grade II paper that specifically addressed WAD patients (and it had a negative result); a small handful of lesser quality papers addressed various treatments of chronic neck pain of unspecified aetiology. The task force recommended that, if patients had residual symptoms or incapacity after six months, they be sent to a multidisciplinary consultation with health care professionals including doctor, physiotherapist, occupational therapist, and psychologist (2). The recommendation was not based on any evidence supporting the efficacy of multidisciplinary pain clinics for chronic WAD, but rather, on consensus in the absence of evidence. Consensus is vulnerable to a multitude of biases and stakeholder influences. It should be replaced as soon as quality evidence emerges. So how far have we come since 1994? Not far enough. Let us look at levels of evidence for the various treatments which have been advocated for chronic WAD.

Conservative / non-invasive therapies

There is no Grade II evidence on the efficacy of any conservative / non-invasive therapy for chronic WAD (including rest, collars, traction, home exercise, TENS, ultrasound, electromagnetic therapy, multimodal therapy, mobilisation, tailored physiotherapy, or "multidisciplinary pain clinic therapy"). There is a recent uncontrolled study of a four-week, multimodal treatment program, involving graded return to activity, correction of pain behaviour, and restoration of muscle strength and endurance, for the treatment of chronic neck pain after whiplash (3). At six month follow-up, pain was reduced to "healthy" levels in 46%; disabilities reduced to normal in 38%; cognitive and behavioural complaints eliminated in 90%; return to work in 65%; ceased drug use in 58%; and ceased pursuing medical care in 81%.

For chronic neck pain of unspecified aetiology, more data are available. "Neck school" was found to be no more efficacious than no treatment (4). Wearing magnetic necklaces was no more efficacious than placebo necklaces at three weeks (5). Acupuncture was no more efficacious than mock TENS (6,7) or mock acupuncture (8). One study reported greater improvement from manipulation over mobilisation, but did

not provide data on efficacy beyond the minutes following treatment (9). No lasting difference in efficacy could be found between manipulation, mobilisation, physiotherapy, intensive training, a muscle relaxant, and general practice care (10-15). Conspicuously, the latter studies reported small effect sizes, did not report the number of patients completely relieved by the various therapies, and did not include natural history control groups. Pulsed electromagnetic therapy delivered through a collar was no more efficacious than collar alone if outcomes of "much better" or "completely well" were considered the treatment goal (16). One study reported that a water-based pillow provided significantly greater improvements in morning pain intensity and average pain score, compared with a usual pillow or roll pillow (17). One matched cohort study, including patients with chronic neck, shoulder or back pain, reported that a 4-week full-time outpatient multimodal cognitive-behavioural treatment program reduced pain intensity and patient-reported pain coping ability at work (1). But the treatment did not reduce sick leave, and the 95% confidence interval for the reduction in pain intensity attributable to the treatment was 0.1-12.3 on a 100 point visual analogue scale.

*Division of Anaesthesia, Intensive Care & Pain Management, John Hunter Hospital, Newcastle, New South Wales, Australia

Drug therapies

There have been no primary Grade I or II studies of drug therapy (including topical creams, simple analgesics, non-steroidal anti-inflammatory drugs [NSAIDs], opioids, muscle relaxants, membrane stabilisers, or psychotropic drugs) for chronic neck pain after whiplash.

Some secondary data can be gleaned from studies in which drugs have been used as comparison or control therapies. However, most address acute WAD or acute neck pain, rather than chronic cases. Nevertheless, "oral analgesia" (19), an American compound analgesic (20), salicylate (21), and mefenamic acid (22), have each been shown to decrease pain scores. Because natural history control groups were not incorporated into study designs, an efficacy superior to placebo cannot be confirmed.

Injections

There is no published evidence that trigger point injections are efficacious for chronic neck pain due to whiplash or, indeed, any aetiology. Belief in the efficacy of trigger point injections is sustained only by repeated anecdotes, assertions, and case-series. These are the least compelling forms of evidence, because they are confounded by observer bias, recall bias and ignore the placebo effect. Similarly, prolotherapy is advocated by some, but remains unsubstantiated by any formal case series describing its utility or any controlled trials examining its efficacy.

For the treatment of chronic neck pain after whiplash, a controlled trial showed that subcutaneous injections of sterile water in 5-80 sites on up to three separate occasions were more efficacious than injections of normal saline (23). It was not possible to conduct a blinded trial as sterile water injections were intensely painful. Although a significantly higher proportion of the sterile water-injected patients were "improved" or "much improved" at three months, only 10 of the 20 patients were "much improved", and there was no difference evident at eight months.

A randomised double-blind controlled trial of intra-articular injections of betamethasone in the treatment of chronic cervical zygapophysial joint pain after whiplash showed no benefit beyond that obtained using intra-articular injections of bupivacaine alone (24). Irrespective of treatment group, most patients experienced return of their pain within 10 days with only 10% having sustained relief at 80 days. The number needed to treat precludes presumptive use of this treatment.

Surgery

The Quebec Task Force found no literature on surgical therapy for chronic WAD. Surgical treatment for neck pain, in the form of disc excision and anterior cervical fusion, is performed in some centres, using various diagnostic indicators. The encouraging series that have been published (25,26) are uncontrolled, and have limited outcome reporting. Other studies have been discouraging (27,28). Although zygapophysial joint capsulectomy and posterior fusion have been advocated, studies of utility or efficacy have not been forthcoming.

Radiofrequency neurotomy

This is the one surgical therapy for chronic neck pain that has been subjected to randomised double-blind placebo-controlled clinical trial (29). It is indicated only for those patients diag-

nosed as having cervical zygapophysial joint pain on the basis of placebo-controlled or comparative local anaesthetic blocks (30). The procedure conferred complete relief of pain in some 70% of patients in the active treatment group. The benefit was statistically significant – the median duration of relief being 263 days for the active treatment group but only nine days for the placebo group (29). While pain relief lasts it is associated with restoration of activities of daily living and normalisation of psychological profile, but it is not permanent. Long-term follow-up studies have shown that when pain returns, relief can be reinstated by repeat neurotomy (31). Recent work suggests that a modified technique renders radiofrequency neurotomy also efficacious for the hitherto challenging third occipital neurotomy (30,32). The procedure is limited by its possible technical failures and because it is arduous. Enthusiasm to make this technique more available should be tempered with caution, as its utility may be corrupted by untrained or inexperienced operators.

Recommendations for treatment of chronic cases:

Before commencing treatment, establish whether there are any neurological features consistent with radicular pain wherefore investigation, referral and neurosurgical care are appropriate.

In the absence of neurological compromise, the clinician might elect to treat the patient generically, investigate for the presence of cervical zygapophysial joint pain using diagnostic local anaesthetic blocks, or refer to a practitioner skilled to do so.

When formulating a generic treatment strategy, the following evidence-based considerations pertain:

1. No physical therapy is justified by quality evidence;
2. A water pillow might reduce morning pain (one study);
3. Analgesics might be justified on humanitarian grounds, but their superiority to placebo has not been established, so avoidance of iatrogenic side-effects and morbidity is an ethical imperative;
4. Although referral to a multidisciplinary pain team was advocated by the Quebec Task Force consensus panel, there are no data to support the efficacy of this resource-intensive strategy.
5. If the patient is diagnosed as having cervical zygapophysial joint pain based on controlled blocks, perform radiofrequency neurotomy.

If the patient does not satisfy the diagnostic criteria for cervical zygapophysial joint pain, the clinician might elect to employ a generic strategy (see above), or to explore other specific diagnoses. Recognition, by both clinician and patient, of the reliability and limitations of other diagnostic techniques (eg, intraarticular injections of the craniocervical joints, provocation discography), is important. Any treatments based on such diagnoses might be best reserved for the context of clinical trials conducted under the auspices of ethics committees or institutional review boards, and designed to evaluate efficacy and safety.

REFERENCES

1. BARNSLEY L, LORD SM, BOGDUK N. The pathophysiology of whiplash. In: *Cervical Flexion-Extension/Whiplash Injuries*, SPINE: State of the Art Reviews Volume 12, No. 2, edited by MALANGA GA. Hanley & Belfus Inc, Philadelphia 1998. Chapter 1, pp. 209-242.
2. SPITZER WO, SKOVRON ML, SALMI LR, ET AL. Report of the Quebec Task Force on Whiplash-Associated Disorders. *Spine* 1995; 20(Suppl 8):S1-S73.
3. VENDRIG AA, VAN AKKERVEEKEN F, MCWHORTER KR. Results of a multimodal program for patients with chronic injury of the neck. *Spine* 2000; 25:238-244.
4. KAMWENDO K, LINTON SJ. A controlled study of the effect of neck school in medical secretaries. *Scand J Rehab Med* 1991; 23:143-152.
5. HONG CZ, LIN JC, BENDER LF, ET AL. Magnetic necklace: its therapeutic effectiveness on neck and shoulder pain. *Arch Phys Med Rehabil* 1982; 63:462-466.
6. LEWTH GT, MACHIN D. A randomised trial to evaluate the effect of infrared stimulation of local trigger points versus placebo on the pain caused by cervical osteoarthritis. *Acupunct Electrother Res* 1981; 6:277-284.
7. PETRIE JP, HAZLEMAN BL. A controlled study of acupuncture in neck pain. *Brit J Rheumatol* 1986; 25:271-275.
8. THOMAS M, ERIKSSON SV, LUNDBERG TA. A comparative study of diazepam and acupuncture in patients with osteoarthritis pain: a placebo controlled study. *Am J Chin Med* 1991; 19:95-100.
9. VERNON HT, AKER P, BURNS S, ET AL. Pressure pain threshold evaluation of the effect of spinal manipulation in the treatment of chronic neck pain: a pilot study. *J Manipulative Physiol Ther* 1990; 13:13-16.
10. HOWE DH, NEWCOMBE RG, WADE MT. Manipulation of the cervical spine: pilot study. *J Roy Coll Gen Pract* 1983; 33:574-579.
11. SLOOP PR, SMITH DS, GOLDBERG E, DORE C. Manipulation of chronic neck pain: a double-blind controlled study. *Spine* 1982; 532-535.
12. KOES BW, BOUTER LM, VAN MAMEREN H, ET AL. The effectiveness of manual therapy, physiotherapy and treatment by the general practitioner for nonspecific back and neck complaints: a randomised, clinical trial. *Spine* 1992; 17:28-35.
13. HURWITZ EL, AKER PR, ADAMS AH, ET AL. Manipulation and mobilisation of the cervical spine: a systematic review of the literature. *Spine* 1996; 21:1746-1760.
14. JORDAN A, BENDIX T, NIELSEN H, ET AL. Intensive training, physiotherapy, or manipulation for patients with chronic neck pain: a prospective, single-blinded, randomised clinical trial. *Spine* 1998; 23:311-319.
15. CASSIDY JD, LOPES AA, YONG-HING K. The immediate effect of manipulation versus mobilisation on pain and range of motion in the cervical spine: a randomised controlled trial. *J Manipulative Physiol Ther* 1992; 15:570-575.
16. FOLEY-NOLAN D, BARRY C, COUGHLAN RJ, ET AL. Pulsed high frequency (27 MHz) electromagnetic therapy for persistent pain: a double-blind, placebo-controlled study of 20 patients. *Orthopedics* 1990; 13:445-451.
17. LAVIN RA, PAPPAGALLO M, KUHLEMEIER KV. Cervical pain: a comparison of three pillows. *Arch Phys Med Rehab* 1997; 78:193-198.
18. JENSEN IB, BODIN L. Multimodal cognitive-behavioural treatment for workers with chronic spinal pain: a matched cohort study with an 18-month follow-up. *Pain* 1998; 76:35-44.
19. MEALY K, BRENNAN H, FENELON GCC. Early mobilisation of acute whiplash injuries. *BMJ* 1986; 292:656-657.
20. MCKINNEY LA, DORNAN JO, RYAN M. The role of physiotherapy in the management of acute neck sprains following motor traffic accidents. *Arch Emerg Med* 1989; 6:27-33.
21. BRODIN H. Cervical pain and mobilisation. *Int J Rehabil Res* 1984; 7:190-191.
22. FOLEY-NOLAN D, MOORE K, CODD M, ET AL. Low-energy high-frequency pulsed electromagnetic therapy for acute whiplash injuries. *Scand J Rehabil Med* 1992; 24:51-59.
23. BYRN C, OLSSON I, FALKHEDEN L, ET AL. Subcutaneous sterile water injections for chronic neck and shoulder pain following whiplash injuries. *Lancet* 1993; 341:449-452.
24. BARNSLEY L, LORD SM, WALLIS BJ, BOGDUK N. Lack of effect of intra-articular corticosteroids in chronic cervical zygapophysial joint pain. *N Engl J Med* 1994; 330:1047-1050.
25. KIKUCHI S, MACNAB I, MORAUEU P. Localisation of the level of symptomatic cervical disc degeneration. *J Bone Joint Surg* 1981; 63B:272-277.
26. WHITECLOUD TS, SEAGO RA. Cervical discogenic syndrome. Results of operative intervention in patients with positive discography. *Spine* 1987; 12:313-316.
27. DE PALMA AF, ROTHMAN RH, LEVITT RL, HAMOND NL. The natural history of severe cervical disc degeneration. *Acta Orthop Scand* 1972; 43:392-396.
28. ALGERS G, PETTERSSON K, HILDINGSSON C, TOOLANEN G. Surgery for chronic symptoms after whiplash injury. Follow-up of 2 cases. *Acta Orthop Scand* 1993; 64:654-656.
29. LORD SM, BARNSLEY L, WALLIS BJ, McDONALD GJ, BOGDUK N. Percutaneous radiofrequency neurotomy for chronic cervical zygapophysial joint pain. *N Engl J Med* 1996; 335:1721-1726.
30. LORD SM, McDONALD GJ, BOGDUK N. Percutaneous radiofrequency neurotomy of the cervical medial branches: a validated treatment for cervical zygapophysial joint pain. *Neurosurg Q* 1998; 8:288-308.
31. McDONALD GJ, LORD SM, BOGDUK N. Long-term follow-up of patients treated with cervical radiofrequency neurotomy for chronic neck pain. *Neurosurgery* 1999; 45:61-68.
32. GOVIND J. Diagnosis and treatment of C2-3 headaches (Abstract). Proceedings of the International Spinal Injection Society (ISIS) 8th Annual Scientific Meeting, San Francisco, 2000 p. 20.

This material was presented at the International Congress on Whiplash Associated Disorders, Berne, Switzerland, March 8 to 10, 2001. The paper appeared originally in the book *"Whiplash Associated Disorders" – medical, biomechanical and legal aspects*, published by Staempfli Publishers Ltd, Berne 2002. The paper is published in North America in *Pain Research & Management* with the permission of Staempfli Publishers Ltd.