The best approach to the problem of whiplash? One ticket to Lithuania, please

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Abstract

The Quebec Task Force (QTF) on Whiplash Associated Disorders (WAD) - 1995 - sent a clear message that we need to re-evaluate the basis for our treatment strategies, and in particular place more emphasis on research to better define these strategies. Judging by many of the clinical strategies currently in use, the Task Force recommendations seem to have been largely ignored three years later. A further compelling reason to re-evaluate our current practices at this time is the finding of much more rapid recovery rates in some cultures, even with little or no therapy. This commentary is a frank consideration of the therapeutic community's responsibility to not only help solve the dilemma of whiplash, but also avoid contributing to the problem. We thus explore a new biopsychosocial model of whiplash, considering the effects of symptom expectation, amplification, and attribution in chronic pain reporting. Based on that model we propose a treatment strategy, and conclude that such strategies provide the only viable approach to this medicolegal and social dilemma.

Key words

Whiplash, neck pain, neck sprain, traffic accidents, epidemiology, physical therapy, exercise therapy.

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Abbreviations:
WAD: Whiplash-Associated Disorder,
QTF: Quebec Task Force (on WAD).

Introduction

The Quebec Task Force (QTF) on Whiplash-Associated Disorders (WAD) pointed out that there are few studies to support most of the therapies (many of them expensive) used to treat whiplash patients (1). The QTF define whiplash-associated disorders as the various clinical manifestations of a "whiplash injury". The reader is referred to their monograph for further explanation of their classification scheme [1, pgs. 22S-23S] which would classify most "whiplash" patients as Grade 1 or 2; that is, with at most "soft-tissue injuries". This commentary will focus on the treatment of these first two grades (i.e., patients without cervical spine fractures, dislocations, or clear-cut, objective neurologic lesions), as these are the patients we encounter most often with chronic pain and disability.

Methods - Developing a biopsychosocial model

Theories explaining the origin of chronic whiplash associated disorder have been based on a dualistic model, implying that it is ongoing physical (biological) damage that determines the patient's chronic pain and behaviour after the acute whiplash injury. This has been considered elsewhere as inadequate. Thus, a biopsychosocial model has been proposed to explain the reporting of chronic pain (2-4). The basis for reporting symptoms of so-called temporomandibular disorders and "neurological symptoms" has also been dealt with elsewhere, and since the factors involved overlap in both instances, they will not be further dealt with here (5, 6).

The biopsychosocial model of whiplash suggests that the biological elements are not a form of chronic damage from the accident, but rather that there are several factors, as shown in Table I. Of course, it seems somewhat puzzling that these benign sources, which are usually experienced by most of the general population as minor and not disabling, should be the basis of chronic pain reporting in whiplash patients. The "bio-" aspect of this model is merely the substrate upon which the "- psychosocial" factors act. Indeed, the Lithuania data showed the prevalences of spontaneous and chronic neck pain one year post-accident to be the same as that in the uninjured, healthy population (7, 8). Since these studies were controlled, there is no reason to believe that Lithuanians are less susceptible to chronic pain than people in others areas. Without the additional, local psychosocial factors whiplash claimants in, say, North America, would simply recover at the same rates (i.e., within a few weeks) seen in Lithuania (7), Greece (9), and Germany (10). Yet, in Canada, for example, accident victims with similar collisions as in those other countries fare much worse, with 50% reporting chronic symptoms even after 6 months (11). Although we do not have specific data, our own experience also recognises the paradox that the offending ("at-fault") drivers rarely, if ever, present with chronic pain following these collisions.

To say that psychosocial factors are operative is not to say that the chronic pain is merely the somatic component of an anxiety disorder or a psychiatric disease, nor a "litigation neurosis". Instead, the psychosocial factors chiefly alter how the accident victim behaves following the initial injury, and how they perceive, report, and attribute pain arising, often from normal daily incidents.

The first way in which these psychosocial factors operate is in the prevailing expectation following the acute whiplash injury, or the diagnosis of "whiplash", that one is at risk for a chronic, disabling

Table I. The physical sources of pain in chronic whiplash-associated disorder (WAD).

Acute neck sprain (symptoms for up to 6 weeks in Lithuania, Greece and Germany)
Development of poor posture (due to reduced activities and as a maladaptive, "protective" response to one's pain)
The background prevalence of neck and back pain in the general population (from the "wear and tear" of daily life, occupations, and recreations)

disorder. With this expectation in mind, the patient views the acute injury as potentially serious, and is hypervigilant for future bodily symptoms. This is symptom amplification, and it occurs for many reasons (4). In such a state, minor symptoms from benign sources are felt to be more severe, with concerns that they represent some serious, and perhaps incurable, damage. The individual responds to these thoughts with a hypervigilance for further symptoms that he/she believes may herald a "progression" of disease, damage, and disability. This is even more likely when the individual is labelled with a medical diagnosis (e.g., whiplash injury) that "promises" that the individual can expect chronic pain and disability. We also suggest that the experience of frequent reporting to therapists or physicians, keeping a careful diary (written or mental) of symptoms, also amplifies the pain experience. While it is understandable that a claimant desires to have all of their perceived injuries documented for the purpose of seeking monetary compensation or insurance reimbursement, there is no doubt that this amplifies symptoms.

The other effect of psychosocial factors is symptom attribution. Since many of these patients are treated as if they have a "chronic injury", and since the diagnosis may signify chronic pain and disability, future episodes of pain will usually be assumed to be caused by that "chronic injury". They attribute future symptoms to this one process - as do many of those around them. Because a pain from different regional causes is often indistinguishable, it is difficult for the patient to know if what started their pain is perpetuating it. So, unrelated and new sources of pain, like the development of poor posture, will simply appear to be part of a long history of symptoms all linked as belonging (attributable) to "ongoing damage".

Both patient and therapists may suffer from this malady of attribution. The ongoing pattern of "pain relapses" generates more anxiety, and further reductions in activity, et cetera - the very same events that may generate more pain: a self-fulfilling prophesy of chronic pain and disability. Add to this the effect that secondary anxieties, anger, resentment, battling with one's insurance company, and money may have on symptom reporting, one produces a patient with chronic pain that they attribute fully to an accident. It is the amplification of benign sources of pain from many aspects of life that is new. These sources have often been overlooked. Even if the patient did recall having the odd pain here and there before the accident, they may forget or supress it. Their only conclusion must be that they arise now from some new source - chronic damage in their neck.

Results and discussion - A change in treatment approach

It is from this biopsychosocial model, and an appreciation of what is happening to whiplash patients in, for example, Lithuania, Greece, and Germany (4) that one can consider the practical choices in therapy. The first practical consideration is a recognition that there is a minority who will not respond to any treatment approach. The malingerer will not respond. Insurance fraud is a problem, and it is sadly true that both physicians and therapists are sometimes a part of that problem (12). There are other patients for whom the accident appears to be a solution to their life problems. Therapy would require the physician to be able to break through the motivations that encourage adoption of the sick role, and to not act as an enabling gate-keeper for the disability (13). These patients are likely to remain symptomatic even after they receive their monetary reward since the sick role is very important to them (14).

In those without the above overwhelming barriers to recovery, one can proceed to promote health behaviours as shown in Table II.

Education

The ultimate goal of therapy is really an attempt to alter the behaviour of the injured individual so that they view their injury and pain as a Lithuanian would - as a benign, self-limited minor problem. (Hence, one ticket to Lithuania, please.) Patients have heard or will hear many things about whiplash, much of which may be false. It is unpalatable to them to simply say: "this is a minor injury, and do not worry about it". This is contrary to so much of what they have heard or will hear elsewhere. Instead, it seems more reasonable to explain to the patient that "while it is true that some people do go on to report chronic pain after an acute whiplash injury, the damage from the acute injury does not cause the chronic pain. Other things do, and you can prevent them from acting to cause chronic pain for you."

It is also reasonable to let the patient know that after an acute injury, especially if that injury seems severe, one becomes much more aware of one's body than ever before. This may actually be a protective mechanism, but whatever the cause, it means that one is going to notice every little ache and pain and experience it as more severe. The patient will otherwise assume that their every symptom must be due to the accident damage, and intentionally or not, they may be encouraged by others to do so. Future aches and pains from daily life or occupations will occur, but again with education, should be accepted as normal experience and should not be amplified. Again, they should be reminded that many of these aches and pains were actually experienced before the accident. The patient may otherwise feel these pains could not possibly be from any source other than the accident because

Table II. Promoting health behaviour rather than illness behaviour.

By an analogy with ankle sprain:
Explain that the period of acute injury is over within weeks
Explain how patients can determine their own outcome
Explain that activity is helpful and rest is harmful
Emphasise the benign nature of coincidental radiologic findings
Maintain healthy postures
Minimise medications (especially those with many adverse effects)
Avoid passive therapy

they seem so severe.

It is remarkable that while epidemiological studies report high prevalences of neck and back pain both in various occupations and in control populations (15-19), whiplash patients rarely report any recollection of pre-accident neck and back pain, despite having belonged to at least some of those groups (20). Is this because they are deliberately denying it (for fear that it will reduce their claim), or because they genuinely do not, like most of us, remember minor daily aches and pains in circumstances where symptom amplification is not operative?

Patients withdraw from normal activities because they are afraid to be more active since, like many physicians and therapists, they identify pain with disease or damage. The QTF recommends for grade 1 WAD that "rest should not be prescribed", and for grade 2 that "rest more than 4 days should not be prescribed". A recent study confirmed the value of these recommendations (21). Yet, consider how many patients receive instructions contrary to these. In Lithuania, Greece, and Germany, whiplash patients routinely return to work early (absence is measured in days, not weeks) despite pain, and yet do remarkably well.

Patients are told that their x-rays show "straightening of the lordosis" or "disc disease" or "arthritis", without an explanation that the radiologic findings are meaningless in terms of symptom production or outcome, or indeed that they are either normal or age-related findings (2-4). The patients might have their symptoms whether the x-ray was normal or not, and many healthy subjects have these very same abnormalities with no symptoms at all. The reporting of irrelevant radiologic findings, however, may nevertheless convey the impression of "damage" and perhaps lead to chronic pain and disability.

The list below suggests ways to reduce these fears and anxieties (22, 23):

"Hurt does not mean the same as harm. In the early phases of an injury, the tissues swell and can be painful. Such pain is not harmful to you, it is part of the normal healing and recovery process."

"When you do these exercises, it may hurt more in the beginning as you stretch out some of that injured tissue, so don't be alarmed."

"When you do this particular exercise and feel a pulling sensation in your neck - well, that is a sign that you should probably do more, not less, of that particular exercise in order to stretch out some of the tight tissues that are causing that pulling feeling."

"The joint cartilage, including the discs, do not have any blood supply, they only get their nourishment through movement of the joint. That is why it is very important to keep your joints moving. In addition, it's important to move the joints of the neck the full range in all directions, so that the corners of the joints have a chance to be nourished, too. It is important to move your neck through its full capable range many times per day."

"It is far more important for you to try to stay at work and not lose the momentum of your life. The neck will not get any worse at work than it will at home. So try to stay at work, this is not the time to quit."

While these statements are not entirely based on research findings, they encourage a belief system that fosters healthy behaviours. The contrary and often conventional other advice has not only no evidential backing, but encourages disability, abnormal illness behaviour, and provides tertiary gains for the therapist.

Maintaining and correcting posture

Although this phenomenon has not been well studied, poor posture appears to generate neck and back pain on its own (15, 24-29). That is, healthy subjects when placed into such postures, report neck and back pain, although the exact anatomical structure responsible for this is not known. Whatever its basis, this association provides an explanation for the development of some of the symptoms of whiplash patients.

The patient may not even recognise that his/her pain now arises from a source different from the original injury that resolved long before.

Certain measures correct poor posture. They include neck retractions and back extensions, with use of a lumbar roll or equivalent placed along the upper part of the low back to break the habit of slouching (24, 29). Maintaining usual activities is likely also to be helpful.

Avoid passive therapy

It may be that some of the passive modalities such as acupuncture, massage therapy, chiropractic therapy, and others (ultrasound, TENS, et cetera) have some symptomatic benefit. No one really knows, however, because no one has bothered to check most of these. An impassioned plea was made by a member of the American Physiotherapy Association for the QTF to support the use of a "multimodal" approach combining exercise therapy and these passive modalities (30).

The QTF response was equally an impassioned plea for the American Physiotherapy Association to do a study and gather data to support its point of view (31). Despite the large number of therapist associations, and the thousands upon thousands of patients available for study, none of these associations have taken up the QTF challenge, now 3 years old, viz: To provide controlled studies - or even one controlled study. This is especially true for chronic pain (more than 3 to 6 weeks) duration.

The QTF has reviewed these forms of therapy (1). Their conclusions are that they do not support the use of cervical pillows, electromagnetic collars, chiropractic therapy (certainly not in the long term, if at all), massage therapy, or acupuncture until controlled trials are available. Yet these modalitites are routinely prescribed. The QTF gives a weak recommendation for passive mobilisation techniques in the first 3 weeks following the accident, but not thereafter. This seems to be supported by a recent German trial (10), but then people recover rapidly in Germany in any case.

Medications

The QTF does not recommend the use of non-steroidal anti-inflammatory drugs (NSAIDs) beyond 3 weeks from the accident. They do not recommend narcotic analgesics at all for Grade 1 or 2 WAD. They do not recommend muscle relaxants. They do state that it is acceptable to use minor tranquillisers and antidepressants as part of the management of what they called chronic pain (> 3 months). Considering the causes of behaviours in whiplash patients, it seems reasonable not to expect medications to be a long term solution, and perhaps they may reinforce the idea of serious injury (recall, Lithuanians recover with little use of medication). It is also evident that

medications may actually be responsible for some of the symptoms whiplash patients report (6).

Chronic disability cases

One matter which the QTF did not extensively address is the patient who has had passive therapy for a year, say, and who has undergone a marked reduction in activity. Such patients may be the victims of medicalization, and could require re-education to change how they view their activity level in response to pain. They are usually placed in multidisciplinary programs, composed mainly of exercise and psychotherapy. In some cases the psychotherapy is cognitive-behavioural (in order to change the patient's belief system regarding his plight and his pain behaviour) while in others it is the unhelpful and disability-encouraging hand-holding type of therapy ("let me offer you support and help you cope with your terrible pain"). The programs are expensive, and often may last for 4 to 12 weeks. There are no valid studies in whiplash patients to indicate that these are actually effective, nor whether they need to include all the expensive facets. It has been the experience of many an insurance company that despite these expensive programs, many patients continue to report symptoms, and claim they cannot work. Elsewhere we have discussed the risk factors for this behaviour, and if these are not recognised, therapeutic efforts will be futile (14). One wonders whether, prior to entering such a treatment course, a more effective approach may be to have an independent forensic examiner in psychology evaluate the patient to identify the risk factors and barriers preventing recovery.

Criteria for assessing the possibility of chronic injury

Table III provides a more structured set of criteria to help the physician exclude with high probability a chronic injury as the cause for chronic persistent pain, and thereby allow the physician to more confidently point a patient in the right therapeutic direction at an earlier stage. In addition, physicians are also often asked to assist lawyers and insurance assessors in the determination of the medical cause of the chronic pain reported following an accident. In the case of Grade 1 or 2 whiplash-associated disorder, we would suggest that these criteria address the probability that the patient could have suffered an injury that in turn has caused chronic damage and is responsible for persistent symptoms. (The courts deal in probabilities, often much less than the threshold of 95% required in a scientific study, when making such determinations.) There are circumstances wherein one may consider chronic pain to be causally related to an accident in the absence of chronic injury, the acute injury having resolved and the persistence of symptoms being mediated through definable psychological illness. The considerations of such cases have been dealt with elsewhere (13). Here we are concerned with claims of physical injury as a basis for chronic pain in Grade 1 or 2 WAD. These criteria derive from from several scientific sources:

1) Experimental collisions with volunteers (2-4).
2) Data from observation of the natural history of probably most of the varying types of injuries responsible for Grade 1 or 2 whiplash-associated disorder in Lithuania (7), Greece (9), and Germany (10), where recovery routinely occurs within 6 weeks or less, leaving no detectable chronic se-

Table III. Criteria for establishing the probability of a causal relationship between acute whiplash injury (excluding grades 3 and 4) and chronic symptoms. If the criteria are not met, it is highly improbable that chronic injury following accident is the basis for the chronic symptoms.

1) When available from an engineering analysis, the change in velocity (delta V) for the struck vehicle should be at least 17 km/h (which if the involved vehicles are of similar mass computes to a striking speed of 26 km/h) in a rear-end collision (2-4). The change in velocity in a frontal or lateral collision should be at least a delta V of 34 km/h (32).

   There is sufficient evidence from experimental collisions, and from Lithuanian data to indicate that collisions below these thresholds very likely produce only a short-lived injury with short-lived effects (measured in weeks).

2) The onset of significant or pronounced neck pain and/or headache is within 48 hours of the accident event.

3) The symptoms follow traumatologic principles, wherein symptoms are of maximal intensity within 48 hours of the accident event, and that there be steady improvement over time.

   Where there is not steady improvement (i.e., where traumatologic principles are not observed), then one has the onus of explaining what factor has intervened to alter this pattern, and its relationship to the accident.

4) There is no significant pre-accident history of similar symptoms.

   If there is a significant pre-accident history, the burden of demonstrating a new effect from the accident, and particularly a persistence of symptoms as a result of the accident, is raised. The more significant (in terms of frequency and need for treatment or use of disability in the pre-accident stage) the pre-accident history of pain, the higher the burden of proof.

5) Significant signs of non-organic features on examination (Waddell's signs) or inconsistencies should to be minimal, as they otherwise preclude the ability to reasonably ascribe the persistence of symptoms to a chronic injury.

   Waddell's signs indicate that physical pathology cannot explain behaviour, and have been sufficiently described to allow one to positively identify when psychological (conscious and non-conscious) factors are operative (33). Waddell's signs include diffuse, superficial tenderness, non-anatomic sensory or motor deficits, and exaggerated pain responses to light touch. Spurious signs or inconsistencies include, for example, observations both outside and inside the examination room of significant improvement in neck range of motion, or via video surveillance, or past medical records refuting a patient's testimony, et cetera.

quelae and certainly no chronic disability.
3) Traumatologic principles.
4) Comparative epidemiology of headache and chronic neck pain in non-traumatised populations (7).

From these sources one can state what circumstances probably (more likely than not) result in a benign injury with a good outcome and can further rule out with a relatively high probability chronic symptoms following most accidents associated with whiplash-associated disorders Grade 1 and 2. In view of the results of the studies in Lithuania, Greece and Germany one is tempted to dismiss a causal relationship (at least via chronic physical injury) in any case. Although one can never be 100% certain, one can state when it is highly improbable that chronic pain arises from the physical injury.

The authors suggest the use of these five minimal criteria, which should all be fulfilled for acceptance of a causal relationship between a whiplash injury and chronic pain arising from the physical injury. In cases where these criteria are not met, then one would conclude that it is more probable that a benign injury with short-lived effects took place and that other factors may explain the persistence of symptoms.

We appreciate that these criteria are much less rigid than the data from Lithuania, Greece, and Germany seem to require. On the basis of those data alone one could really question the validity of any claim of chronic injury in WAD Grade 1 or 2. However, at least the benefit of the doubt can be afforded if all of the above minimal criteria are met.

Conclusion

An approach to therapy must ultimately begin with an appreciation of why the patient is reporting his/her symptoms. Treating the subject as an "injured" person and ignoring the other factors that are operative will merely contribute to the problem, not solve it. It is increasingly clear that active therapy is superior to passive therapy. Whatever the mechanism, whether active therapy has some real, beneficial physical or psychological effect, or passive therapy has a negative effect, or both occur, the difference continues to be noted in studies. Collar use, rest, passive modalities, and encouraging a behaviour where one "does not push one's limits", or "takes it slowly and gradually until fully healed" are not helpful approaches, and may indeed be very harmful. More education for the patient, and less prescription pad calligraphy is the key to offering them an opportunity to do what Lithuanians do - get better promptly - and that is, after all, the goal of most whiplash patients, and their physicians.

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