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CLINICAL APPROACHES

Manual treatment of post-whiplash injury

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Abstract *Introduction*: There are many therapeutic approaches aimed at treating the clinical syndrome resulting from whiplash injury. However, there seems to be little agreement between therapists as to the ideal treatment for these patients. Spinal manipulation/mobilization and soft tissue mobilization techniques are manual therapies commonly used in the management of neck disorders. The aims of the present paper are to detail a manual approach developed by our research group, to help in future studies of the management of the sequels to whiplash injury, and to suggest explanations for the mechanisms of this protocol. These manual approaches are considered by the authors to be more effective than conventional physical therapy in the management of whiplash patients.

Vertebral manipulations: The biomechanical analysis of whiplash injury showed that upper cervical manipulation, cervicothoracic junction manipulation, thoracic spine manipulation, and pelvic girdle manipulation are the major areas requiring such treatment, for beneficial outcomes to be assured. Although the exact biological mechanisms underlying the effects of spinal manipulation are not clearly understood, there are previous papers justifying most methods used in the current experimental protocol.

Soft tissues manipulation techniques: The soft tissues techniques used in this protocol were neuromuscular technique in paraspinal muscles, muscle energy techniques in the cervical spine, myofascial release in the occipital region, and myofascial trigger point manual therapies as required.

Clinical dissertation: The definition of spinal joint dysfunction (hypomobility) implies that muscle shortening is involved. This suggests that manual treatment of persons suffering from whiplash injury requires the treatment of muscular and fascial shortening, as well as the treatment of spinal joint dysfunction, when appropriate.

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Introduction

The Quebec Task Force adopted the following definition of whiplash (Spitzer et al., 1995):

> Whiplash is an acceleration–deceleration mechanism of energy transfer to the neck. It may result from rear-end or side-impact motor vehicle collisions, but can also occur during diving or other mishaps. The impact may result *in bony or soft tissue injuries* (whiplash injuries), which in turn may lead to a variety of *clinical manifestations* (whiplash associated disorders).

The clinical syndrome of whiplash injury includes neck pain, upper thoracic pain, cervicogenic headache (Drottning et al., 2002), tightness, dizziness, restriction of cervical range of motion, tinnitus, and blurred vision (Hohl, 1975; Dvorak et al., 1989). The exact nature of these symptoms is not clearly understood, although the pain is attributed to musculoskeletal disorders, i.e. involving the soft tissues and facet joint dysfunction, caused by the impact (Wiley et al., 1986). Moreover, experimental research involving human cadavers has demonstrated that a variety of musculoskeletal injuries can occur during whiplash, such as muscle and ligament sprains (Barnsley et al., 1998). Several theories have been postulated to explain these symptoms, including vertebral artery insufficiency and injury of the cervical sympathetic chain, in relation to visual disturbances and dizziness (Bogduk, 1986), C1–C2 facet joint injury in relation to headaches (Lord et al., 1996), and paraspinal muscle spasm in relation to neck pain (Teasell and Shapiro, 2001). Moreover, some authors have reported that people suffering from whiplash injury display signs of both central and peripheral sensitization (Koelbaek et al., 1999).

Numerous forms of treatment have been suggested to relieve the symptoms of this clinical syndrome. However, there seems to be little or no agreement between therapists as to the ideal treatment of whiplash symptoms (Valera et al., 2003). Following a literature review relating to the conservative treatment of persons suffering from whiplash injury, Peeters et al. (2001), reported that, despite the many treatments available for these patients, there continues to be no evidence for their accepted use.

Spinal manipulation/mobilization, and soft tissue mobilization, techniques are manual therapies commonly used in the management of neck disorders (Gross et al., 2002). There are many clinical trials that have analysed the effectiveness of cervical manipulation/mobilization in people suffering from mechanical neck pain (Vernon et al., 1990; Cassidy et al., 1992), but there are a few papers analysing the effects of spinal manipulation in people suffering from whiplash injury (Osterbauer et al., 1992).

In a previous paper (Fernández et al., 2004a) our research group demonstrated that current manual treatment methods were more effective than conventional physical therapy in the management of whiplash patients. In this trial it was found that people who were treated with this manual approach had a greater improvement in cervical range of motion, and a greater scores on visual analogue scales, than those treated with conventional physical therapy treatment (comprising massage, ultrasound therapy, exercises at home, and low energy high frequency pulsed electromagnetic therapy). Moreover, patients from the osteopathic group in that trial required 9 sessions to complete the treatment, whereas those from the physiotherapy group needed 23 sessions ($P = 0.002$). The study concluded that the improvement in the experimental group was faster and greater than the improvement in the physiotherapy group.

The manual treatment mentioned in the previous trial (Fernández et al., 2004a) included high velocity–low amplitude techniques (HVLA) applied to the upper cervical spine, cervicothoracic junction, thoracic spine, thoracolumbar junction, and pelvic girdle, as well as neuromuscular technique (NMT) of the paraspinal soft tissues (Chaitow, 2003), muscle energy techniques (MET) applied to the cervical spine (Mitchell, 1995; Chaitow, 2001), craniosacral techniques (von Piekartz and Bryden, 2001), and myofascial trigger point (MTrP) manual therapies (Hou et al., 2002).

The aims of this paper are:

- to detail the manual treatment developed by our research group, to help in future studies involving the management of persons suffering from whiplash injury, and,
- to offer hypotheses of the mechanisms of this protocol

Vertebral manipulations (HVLA techniques)

The goal of joint manipulation is to restore maximal, pain-free movement of the musculoskeletal system (Whittingham and Nillson, 2001). It is suggested that only joints that are found to be hypomobile should be considered as candidates for HVLA techniques. Vertebral manipulations are currently used in the treatment of whiplash injury without the benefit of scientific evidence, so