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CERVICAL PARAMETERS AND MIGRAINE

Upper cervical mobility, posture and myofascial trigger points in subjects with episodic migraine: Case-control study

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KEYWORDS
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Summary *Objectives:* To evaluate the association between episodic migraines and the prevalence of myofascial trigger points (MTrPs) in the sternocleidomastoid and upper trapezius, forward head posture (FHP), neck range of motion (ROM) and cervical facet joint stiffness.
Methods: 20 physiotherapy students with episodic migraines and 20 age- and sex matched healthy controls were included in this observational case-control study. Demographics and headache status were evaluated through questionnaires. Active neck ROM, presence of MTrPs, and cervical facet joint mobility were assessed by physical examination. FHP was measured using a lateral digital photograph taken in a sitting position.
Results: No significant differences were found in neck ROM measurements and FHP between the migraine and control groups. Significant differences were found in the prevalence of cervical facet joints stiffness in Occiput-C1 ($\chi^2 = 4.444$, $p = 0.035$) and C1–C2 ($\chi^2 = 10.157$, $p = 0.001$), but not in other segments. Significant differences were found in the prevalence of active and latent MTrPs between the migraine and control subjects in the right trapezius ($\chi^2 = 11.649$, $p = 0.003$) and right sternocleidomastoid ($\chi^2 = 8.485$, $p = 0.014$).
Conclusions: Our findings support the hypothesis that the prevalence of MTrPs in neck muscles and hypomobility in the upper cervical facet joints are associated with migraines.

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Introduction

Headaches are one of the most common complaints in medical practice (Stovner et al., 2007). The International Classification of Headache Disorders (ICHD-2) (Olesen and Steiner, 2004) categorized migraines and tension headaches as major types of headaches. Migraine is a complex disorder of the central nervous system with a one year prevalence of approximately 12% (Lipton et al., 2007), and thus incurs a substantial economic burden on society (2011). It is characterized by severe, recurrent, usually unilateral pulsating headaches that are usually accompanied by nausea, vomiting, photophobia and phonophobia (Lipton et al., 2001). Typically the headache lasting from 2—72 h, and is generally aggravated by physical activity (2004). During the past few decades, major advances in the understanding of migraine pathophysiology have been made, with major attention paid to the central mechanisms of migraines, particularly to the activation of the trigeminovascular system (Edvinsson, 2001).

Simons et al. (1999) claimed that pain originating in the pericranial, neck and/or shoulder muscles may be referred to the head and experienced as a headache. In their comprehensive text, they described referred pain patterns emanating from different myofascial trigger points (MTrPs) in the head and neck muscles which might potentially contribute to certain head and neck symptoms found in migraine sufferers. MTrPs have been defined as highly localized and hyperirritable points situated in a palpable taut band of skeletal muscle fibers (Han and Harrison, 1997; Simons et al., 1999). When compressed or stretched, MTrPs may elicit local and/or referred pain or local twitch response. There is still a controversy between medical specialists regarding the diagnostic criteria for MTrPs and their existence as a pathological entity. However, there are resent developments of imaging enabling visualization of muscular tissue containing MTrPs (Sikdar et al., 2009) and myofascial tight bands (Chen et al., 2007). These studies and advances in basic research (Hsieh et al., 2011; Shah et al., 2005) provide stronger background for myofascial pain theory.

Boquet et al. (1989) found that upper cervical MTrPs were located ipsilateral to side of pain in 24 subjects presenting with strictly unilateral migraines. In most patients, MTrPs were present even during headache-free periods. Based on these findings, it seems plausible that MTrPs in head and neck muscles might be an initiating or perpetuating factor for some migraine headaches (Fernandez-de-las-Penas et al., 2006b).

Normal posture in the sagittal plane has been described as the alignment of the external auditory meatus over the acromioclavicular joint, aligned with a vertical postural line (Seaman and Troyanovich, 2000; Yip et al., 2008). Local symptoms believed to be associated with forward head posture (FHP), when the head is situated in an anterior position in relation to the postural line (Yip et al., 2008), may include decreased range of neck motion, muscle stiffness or pain, and degenerative changes in the spine. Head and neck aches and shoulder pain are common manifestations of these structural problems (Braun and Amundson, 1989). Chronic tension type headaches (Fernandez-de-Las-Penas et al., 2006a, 2007), cervicogenic headaches (Watson and Trott, 1993) and migraines (Fernandez-de-las-Penas et al., 2006b) have all been associated with a smaller cranio-vertebral angle when compared to controls.

Cervical musculoskeletal abnormalities have been traditionally linked to different types of headaches. However, to our knowledge, only one blinded controlled study found differences in MTrPs prevalence in the head and neck muscles, FHP, cervical facet joint stiffness and neck mobility between episodic migraine subjects and healthy controls (Fernandez-de-las-Penas et al., 2006b). Additional studies are essential to replicate these results in other samples in order to establish a link between the aforementioned cervical findings and episodic migraines.

Several studies found that massage (Hernandez-Reif et al., 1998; Lawler and Cameron, 2006; Noudeh et al., 2012) is effective in reduction of pain intensity and stress level in migraine patients, supporting the circumferential support for connection between cervical parameters and migraine.

We hypothesized that young, apparently healthy individuals with episodic migraines have more prevalent MTrPs in their neck muscles, more prominent FHP, restricted neck mobility and more prevalent stiff upper neck facet joints, then their peers without headaches.

Our aim was to assess the association between the prevalence of MTrPs in sternocleidomastoid and upper trapezius muscles, FHP, neck range of motion, cervical facet joint stiffness and episodic migraines.

Methods

Design

Observational case-control study with a convenience sample.

Setting

Study was conducted at May—June 2012 at Physical Therapy Department, Recanati School for Community Health Professions, Ben Gurion University of the Negev, Beer Sheva Israel.

Sample

Physical therapy students, apparently healthy (without known chronic or acute diseases) males and females, were asked to participate. 105 2nd—4th year students agreed to fill the demographic and headache questionnaire based on the ICHD-2 criteria. Forty subjects, 20 with episodic migraines with or without aura and 20 sex- and age-matched controls with no recurrent headache were volunteered to participate in the present case-control study. Each subject received an explanation as to the aims of the study and methods of data collection (questionnaires, palpation and ROM evaluation), was screening for inclusion and exclusion criteria, and signed an informed consent form. Subjects did not receive any compensation or