

Original article

# Myofascial trigger points in the suboccipital muscles in episodic tension-type headache

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## Abstract

Referred pain evoked by suboccipital muscle trigger points (TrPs) spreads to the side of the head over the occipital and temporal bones and is usually perceived as bilateral headache. This paper describes the presence of referred pain from suboccipital muscle TrPs in subjects with episodic tension-type headache (ETTH) and in healthy controls. Ten patients presenting with ETTH and 10 matched controls without headache were examined by a blinded assessor for the presence of suboccipital muscle TrPs. Diagnostic criteria described by Simons and Gerwin were adapted to diagnose TrPs, i.e. presence of tenderness in the suboccipital region, referred pain evoked by maintained pressure for 10 s, and increased referred pain on muscle contraction. Six ETTH patients (60%) had active TrPs and 4 had latent TrPs (40%). On the other hand, 2 control subjects also had latent TrPs. Differences in the presence of suboccipital muscle TrPs between both groups were significant for active TrPs ( $P < 0.001$ ), but not for latent TrPs. Active TrPs were only present in ETTH patients, although TrP activity was not related to any clinical variable concerning the intensity and the temporal profile of headache. Myofascial TrPs in the suboccipital muscles might contribute to the origin and/or maintenance of headache, but a comprehensive knowledge of the role of these muscles in tension-type headache awaits further research.

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## 1. Background

Headache disorders are one of the most common problems seen in medical practice. Among the many types of headache disorders, tension-type headache (TTH) is the most frequent in adults. Population-based studies suggest 1-year prevalence rates of 38.3% for episodic TTH, and 2.2% for chronic TTH (Schwartz et al., 1998). TTH is considered to be the prototype of headache with myofascial tissues playing an important

role (Jensen and Olesen, 1996). Gerwin (2005) and Jensen (1999) have claimed that pain from pericranial head; neck and shoulder muscles might be referred to the head, and be experienced as headache. Simons et al. (1999) described the referred pain patterns from different myofascial trigger points (TrPs) in head and neck muscles, which produced pain features that are usually found in subjects presenting with TTH. Simons et al. (1999) define a TrP as a hyperirritable spot associated with a taut band of a skeletal muscle that is painful on compression, palpation and/or stretch, and that usually gives rise to a typical referred pain pattern. Active TrPs are cause of clinical symptoms, i.e. spontaneous referred pain and restricted motion of the affected tissues, whereas latent TrPs may not be an immediate source of pain, but might produce other muscle dysfunctions such as fatigue

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and restricted range of motion (Simons et al., 1999). This clinical distinction has been strongly substantiated by histochemical findings, since higher levels of concentration of bradykinin, calcitonin gene-related peptide, substance P, tumour necrosis factor- $\alpha$ , interleukin-1 $\beta$ , serotonin and norepinephrine have been recently found in active TrPs (Shah et al., 2005).

TTH is characterized by bilateral, pressing and tightening head pain, of mild-to-moderate intensity, that is not aggravated during routine physical activity. In the episodic form, patients suffer from headache less than 15 days per month, whereas in the chronic form patients experience headache at least 15 days per month (IHS, 2004). Some characteristics of TTH, such as pressure or band-like tightness (IHS, 1988, 2004), and increased tenderness on palpation of neck and shoulder muscles (Jensen and Olesen, 1996; Lipchik et al. 1997), resemble the descriptions of referred pain originating in TrPs (Simons et al. 1999).

Marcus et al. (1999) found that subjects suffering from TTH showed a greater number of either active or latent TrPs in different muscles than healthy subjects. On the other hand, we have already found that TTH subjects, either chronic or episodic, show a greater number of TrPs in the superior oblique muscle than controls (Fernández-de-las-Peñas et al., 2005). Therefore, it seems plausible that TrPs might play an important role in the genesis of TTH.

Within the cervical musculature, suboccipital muscles can develop TrPs, accounting for a referred pain pattern that spreads to the side of the head over the occipital and temporal bones (Fig. 1). This referred pain extends to both sides, thus being perceived as bilateral headache (Simons et al., 1999). In a series of patients with chronic TTH (CTTH), our research group recently demonstrated that this disorder was associated with suboccipital active TrPs and forward head posture, and that those CTTH subjects with active TrPs had greater headache intensity and frequency than those with latent TrPs (Fernández-de-las-Peñas et al., 2006). Moreover, we have previously found that the management of suboccipital muscle TrPs may produce significant pain relief in subjects presenting with episodic TTH (ETTH) (Fernández-de-las-Peñas et al., 2004). After such early observations, we have extended our former study in CTTH subjects (Fernández-de-las-Peñas et al., 2006) to subjects suffering from ETTH.

This paper describes the presence of referred pain stemming from suboccipital muscle TrPs in subjects with ETTH and in healthy control subjects.

## 2. Material and methods

### 2.1. Subjects

Ten patients presenting with episodic tension-type headache (ETTH) and 10 healthy age- and sex-matched

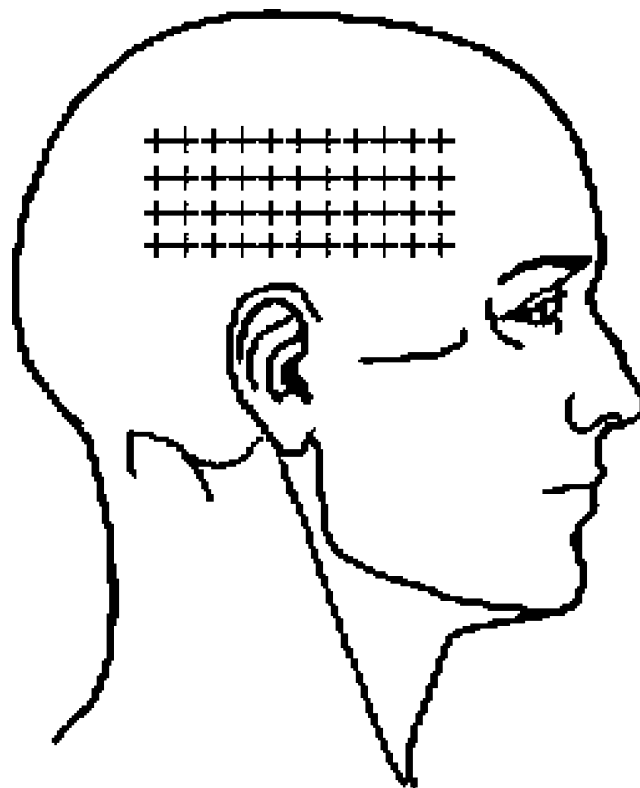


Fig. 1. Referred pain from myofascial trigger points in the suboccipital muscles (rectus capitis posterior minor and major muscles). Adapted from Simons DG, Travell JG, Simons LS. Travell and Simons' Myofascial Pain and dysfunction: The trigger point manual. Volume 1: upper half of the body. (2nd edition) Ed Baltimore: Williams & Wilkins, 1999. Fig. 17.1 (p. 473).

subjects without headache during the previous year participated in this study from June to November of 2004. Patients were recruited from the Neurology Department of Fundación Hospital Alcorcón, whereas controls were recruited from the hospital staff. Patients with ETTH were diagnosed according to the criteria of the International Headache Society (IHS) by an experienced neurologist (IHS, 2004). ETTH patients had to have headache less than 15 days per month. A headache diary was kept for 4 weeks in order to substantiate the diagnosis (Russell et al., 1992). The health status of all participants was clinically stable, without current symptoms of any other concomitant disease. This study was supervised by the Departments of Physical Therapy and Neurology of Rey Juan Carlos University and Fundación Hospital Alcorcón, and it was also approved by the local human research Committee. All subjects signed an informed consent prior to their inclusion.

### 2.2. Myofascial trigger point examination

TrPs were sought in the suboccipital muscles by an assessor who had more than 4 years' experience in TrPs

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