



## Original article

## International consensus on the most useful physical examination tests used by physiotherapists for patients with headache: A Delphi study



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## ABSTRACT

**Background:** A wide range of physical tests have been published for use in the assessment of musculoskeletal dysfunction in patients with headache. Which tests are used depends on a physiotherapist's clinical and scientific background as there is little guidance on the most clinically useful tests.

**Objectives:** To identify which physical examination tests international experts in physiotherapy consider the most clinically useful for the assessment of patients with headache.

**Design/methods:** Delphi survey with pre-specified procedures based on a systematic search of the literature for physical examination tests proposed for the assessment of musculoskeletal dysfunction in patients with headache.

**Results:** Seventeen experts completed all three rounds of the survey. Fifteen tests were included in round one with eleven additional tests suggested by the experts. Finally eleven physical examination tests were considered clinically useful: manual joint palpation, the craniocervical flexion test, the cervical flexion-rotation test, active range of cervical movement, head forward position, trigger point palpation, muscle tests of the shoulder girdle, passive physiological intervertebral movements, reproduction and resolution of headache symptoms, screening of the thoracic spine, and combined movement tests.

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*Conclusions:* Eleven tests are suggested as a minimum standard for the physical examination of musculoskeletal dysfunctions in patients with headache.

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## 1. Introduction

The lifetime prevalence of any headache in the European population is more than 90% indicating the relevance and burden of headache (Steiner et al., 2014). A recent study reported that tension-type headache (TTH) and migraine were also the most common recurrent headache with prevalences of 20.77% and 14.7%, respectively (Vos et al., 2012). Headache compromises a person's quality of life and reduces their functional capability as well as their work capacity (D'Amico et al., 2013; Raggi et al., 2013). This results in high socioeconomic cost mainly due to days off work (Burton et al., 2002; Pradalier et al., 2004; Berg and Stovner, 2005; Bloudek et al., 2012; Lanteri-Minet, 2014).

There is ongoing scientific debate about the contribution of cervical neuromusculoskeletal dysfunction to headache. Although the results of a systematic review suggest that there is probably no influence of musculoskeletal dysfunction in the pathogenesis of migraine (Robertson and Morris, 2008), migraine patients have a high prevalence of neck pain (Ashina et al., 2015) and muscle or joint dysfunctions have been hypothesised to act as triggers for migraine attacks (Vincent, 2011). In TTH patients, muscle tenderness and trigger points are consistent findings (Fernández-de-las-Peñas et al., 2007a, b; Abboud et al., 2013), while the evidence for muscle tension is conflicting (Bendtsen and Fernández-de-las-Peñas, 2011).

Cervicogenic headache (CGH) is the most likely sub-group of headache to present with musculoskeletal dysfunction in the neck (Sjaastad et al., 1998; Zito et al., 2006; Jull et al., 2007). The International Headache Society (IHS) classification version III beta details the clinical features of CGH under section 11.2.1 (Headache Classification Committee of the International Headache Society (IHS), 2013). However, the diagnosis CGH itself is most controversial: Some strongly argue for the neck as a potential headache generator (Bogduk, 1992; Sjaastad et al., 1998; Antonaci et al., 2001; Bogduk and Govind, 2009; Becker, 2010) but others doubt the existence of CGH and propose that the reported prevalence, estimated e.g. as 4.1% in the general population (Sjaastad and Bakketeig, 2008), is due to misdiagnosed migraine or TTH (Pöllmann et al., 1997; Leone et al., 1998).

Patients suffering from headache commonly use self-management strategies such as self-massage, posture correction, stretching and exercises to reduce symptoms (Haque et al., 2012) and seek to reduce medication intake by using additional non-pharmacological therapies, most commonly physiotherapy (Chaibi et al., 2011; Kristoffersen et al., 2012; Chaibi and Russell, 2012, 2014). A physiotherapist will conduct a patient interview to record the headache history, its temporal pattern, symptom behaviour, the patient's medication intake and other relevant health history to ensure that the headache is benign and to classify the type of headache. In order to decide whether and which type of physiotherapy interventions (eg. manual therapy, exercise, soft tissue techniques, or postural correction) are likely to influence the patient's complaints, the subsequent physical examination focuses on the assessment for the presence (or absence) of musculoskeletal dysfunction.

A wide range of physical examination tests have been published for the assessment of cervical musculoskeletal dysfunction in

patients with headache. These include measurement of head/neck posture (Fernández-de-Las-Peñas et al., 2006b), range of cervical motion (Zito et al., 2006; Jull et al., 2007) including the flexion-rotation test (Hall and Robinson, 2004) manual examination to detect painful cervical joint dysfunction (Zito et al., 2006; Jull et al., 2007), tests of cervical muscle function (Zito et al., 2006; Jull et al., 2007), tests for temporomandibular dysfunction (Caspersen et al., 2013; von Piekartz, 2015), palpation for trigger points (Fernández-de-Las-Peñas et al., 2006b) and many others. Currently, there are no published guidelines to support the decision on the most important physical examination techniques. Individual studies have evaluated tests for only one specific headache type (TTH, migraine or CGH) (i.e. Kidd and Nelson, 1993; Jensen and Rasmussen, 1996; Ashina et al., 1999; Calandre et al., 2006; Fernández-de-las-Peñas et al., 2006a; Fernández-de-Las-Peñas et al., 2006b, 2007a, b; Couppe et al., 2007; Bevilacqua-Grossi et al., 2009), or within specific sub-populations (e.g. with associated facial or neck pain (this includes by definition- all studies on CGH). While this serves as an indicator for clinical usefulness of specific tests in specific populations, it does not inform on the usefulness of tests in other headache patients.

This Delphi survey was conducted to identify physical examination tests that international experts in physiotherapy consider the most clinically useful when examining a patient with headache and to specify for which types of headache or in which clinical situation the tests would be useful.

## 2. Methods

### 2.1. Study design

A Delphi-Survey was designed and conducted following the recommendations of Hasson et al. (2000), and published examples of Delphi Surveys with similar research questions (Sinha et al. 2011; Chiarotto et al. 2014). The survey was guided by a systematic evaluation of the literature on physical examination tests proposed for the assessment of musculoskeletal dysfunction in patients with headache. Ethical approval (No: PV5011) was granted by the local ethics authority (Arztammer Hamburg). The data collection was conducted between October 2014 and April 2015.

Selection of experts was based on personal contacts and a search for authors of peer-reviewed publications on physical examination tests in headache populations. There is no guideline to define who is an expert for a Delphi Survey or how many experts are required (Hsu and Sandford, 2007). Twenty international experts (defined as physiotherapists with a special interest in headaches) from nine countries were identified and invited via email to participate. The letter of invitation included the researcher's details and information on the purpose of the survey. It further explained how the acquired data will be used to design subsequent survey rounds. Seventeen experts with backgrounds ranging from dominantly clinical to dominantly research-based, participated in the survey and completed all three rounds of the survey. Participants remained anonymous during all rounds of the survey with the aim that they can express opinions without influence of dominant characters (Murphy et al., 1998). After the final survey round, all experts were invited to be a co-author of the publication and

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