CRITICAL REVIEW OF PHYSICAL SYMPTOMS IN CERVICOGENIC HEADACHE.

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ABSTRACT

The clinical diagnostic criteria of cervicogenic headache that originate from pathology of the cervical spine have been established 20 years ago by Sjaastad. Here we review the literature that is concerned with physical examination aspects in cervicogenic headache in order to improve clinical diagnosis and therapy.

The diagnosis of cervicogenic headache is based on the clinical symptoms, the physical findings and on the use of diagnostic nerve blocks. The physical diagnostics seems however less important in recent praxis. We made a MEDLINE search from 1983, when the clinical picture of the cervicogenic headache was first described. Hundred and sixty-four papers were found with the keyword 'cervicogenic headache'. Eighteen articles, in which physical diagnostics played a significant role in establishing the clinical diagnosis, were selected: 9 controlled studies, 6 papers on investigations, 2 papers and 1 case report in which physical examinations or physical findings have been dealt with. Based on the reviewed references, the following list of the physical examinations may be recommended for the diagnosis of cervicogenic headache: 1. Inspection of neck posture and hypertrophy of muscles (e.g. m. trapezius); 2. Examination of muscle strength, especially the endurance capacity of neck flexors; 3. Active and passive range of movement of the cervical spine, with attention to provocation of pain; 4. Pressure of special points for pain, particularly that of the nerves and cervical joints (zygapophyseal joint) and palpation of painful spasm in the trapezius muscle; 5. The examination of cervical segmental and zygapophyseal joint mobility. (word count: 245)

Keywords: cervicogenic headache, physical diagnostics, physical finding, cervical joint dysfunction.

Abbreviations: cervicogenic headache: CEH; physical diagnostics: PD; zygapophyseal joint: ZJ; segmental dysfunction: SD; myofascial trigger points: MTP; range of movement: ROM

Challenges in evaluating cervicogenic headache

The clinical picture of cervicogenic headache (CEH) has been described 20 years ago by Sjaastad, (1), and its criteria has been established in 1990 (2), nevertheless in reviews and studies doubts and controversies can be found in making the diagnosis of this disorder (3) (4). In the daily practice, the suspicion of cervicogenic headache usually occurs during the patient's interview. The patient is often able to describe clearly the differentiating characteristics of the experienced symptoms. Diagnosis and treatment should be based on the major accepted criteria of clinical presentation and the use of diagnostic nerve blocks. In order to determine the anatomical structures, where the blockade will be used, physical diagnostics (PD) should be performed before using the diagnostic nerve blocks.

During the past 30 years nearly 6000 patients with suspected cervicogenic headache have been seen at the Manual Medicine Department of the National Institute for Rheumatology and Physiotherapy, Budapest (5). We use physical diagnostics (PD) routinely in the differential diagnosis of headaches. Based on these experiences here we critically review the papers that are concerned various PDs. To this end we made a MEDLINE search from 1983 using the keyword 'cervicogenic headache' and 164 papers were found. Eighteen references, in which physical diagnostics played a significant role in establishing the clinical diagnosis, have been selected for reviewing. These included 9 controlled studies, 3 of them used the physical findings as outcome measures, 6 papers investigated the frequency of physical findings, in 2 additional papers and in 1 case report PD played a special role. The heterogeneity of the selected papers have not been suitable for Cohen's kappa analysis, we thought therefore more useful to review the papers according to the logistic of the practical medical examination.

Clinical evaluation

The anatomical structures that are the potential sources of CEH were most extensively studied by Bogduk (6) and reviewed by Frederiksen and Sjaastad (7). The diagnosis of CEH was significantly improved by using special manual diagnostic techniques (8) (9) (10-12). Dumas (13) and Vincent (14) found by *inspection* of the cervical spine's posture that the forward head position was frequent in most of the post-traumatic CEH cases. *Palpation* should be used for the examination of the skin, subcutaneous tissues, muscles, myofascial structures, zygapophyseal joints (ZJ), spinous processes and pressure on nerves. Bansevicius et al (15) studied the "*skin roll test*" (SRT) in CEH patients, tension-type headache, acute ("episodic") and chronic form, and migraine without aura patients. They found that this test contributes little to the differential diagnosis of CEH. There are conflicting reports about the importance of the palpation of the *myofascial trigger points* (MTP) or myofascial pain. According to Borg-Stein (16) MTP-s can refer pain to the head and face in the cervical region, thus contributing to CEH, there was however no proof of this statement, only one reference was quoted on tension headache. Jaeger (17) suggested that myofascial trigger points may be an important pain producing mechanism in CEH and found that palpation of the myofascial trigger points clearly reproduced the patients headache. Fishbain (17;18), in contrast, could not find such tender points, which were suitable for the differential diagnosis of headaches. Leone (4) in a study of 500 headaches did not find any patient whose pain could be provoked by external pressure to the neck. He claimed, furthermore, that the difference between "CEH trigger points" and MTP is not clarified yet. Van Suijlekom et al. (19) studied the *zygapophyseal joint pressure pain* and found that the inter-observer reliability of expert headache neurologists was satisfactory in the majority of the physical examination tests of the cervical spine in patients with different headache syndromes. In a multicentre study Jull et al. (20) assessed the presence of *painful upper cervical joint dysfunction,* and found 70 per cent agreement between examiners on the two most dysfunctional joints in symptomatic subjects. On that basis they stated that painful upper cervical joint dysfunction is a diagnostic criterion for cervicogenic headache. The term of *cervical joint dysfunction* is not generally known or accepted. It is based on the individual mobility of ZJ, that can also be assessed (8), as can the range and quality of movement in each facet (flexion and extension) that should be a basic PD technique in CEH (8;10;21). Jull et al. (21) used the PD of cervical joint dysfunction as outcome measure in a multicentre study of the manipulative therapy in CEH (22). Palpation of *occipital nerves* is generally accepted and routinely performed without difficulty in the clinical practice (20;23). Palpation of *tension/spasm in the cervical muscles*, however, seems to be controversial in different headache types, most of which did not correspond to the criteria of CEH. Bansevicius (24) demonstrated the involvement the trapezius muscle in the pathogenesis of cervicogenic headache, either primarily or more plausibly secondarily. Cervical flexor weakness was used as outcome measure in a controlled study (21), which is in line with the clinical observations of Dumas, who found reduced *endurance capacity of the cervical muscles* (a special test for flexor weakness) in post-traumatic cases, and reduced strength of the extensors as well (13). The *spinal mobility* has been investigated in number of studies. Van Suijlekom et al. (19) found, that reduced range of movement (ROM) in the cervical spine showed kappa scores indicating moderate agreement. Dumas (13) found that the active cervical ROM in flexion/extension and rotations was limited. Assessing the global ROM Vincent et al. (12;14) showed that the extension is reduced in CEH. Zwart et al. (25) demonstrated that in contrast to other headache types rotation and flexion were reduced in CEH. Nilsson et al. (26) assessed the *passive* mobility of the neck and Whittingham (27) concluded that spinal manipulation of the cervical spine increased *active* range of motion in

CEH. Fredriksen (28) found „slight to moderate" reduction of movements in a study on CEH patients, while Petersen (29) also measured impairments in cervical mobility in a case report on successful manipulative therapy. Dumas stressed the importance of the *manual examination and measurement of segmental mobility* (13). Jaeger (17) indeed found that the 91% of CEH patients had specific segmental dysfunction of occiput on atlas and/or atlas on axis. Bono et al. (30) emphasized also the need to localize the level(s) of dysfunction in the cervical spine which may be the target of therapy. Grimshaw (8) gives a detailed "lecture" on the manual diagnostic of cervical segments and ZJs to reveal findings that are characteristic in CEH. In a comprehensive paper Biondi (9) dealt with the biomechanical dysfunctions, which are fundamental in the treatment strategy of CEH.

Conclusions

The appreciation of the PDs in CEH is controversial. The significance of the various physical examinations was different depending on the author's specialisation or skill. Leone et al. (4), for example, could not precipitate head pain by neck movement, while Pikus et al. (31) did not find strong correlation between the operative findings and that of the physical examination. Grimshaw (8), in contrast, emphasized that a careful specific physical examination of the regional and segmental mobility of the upper cervical complex is very important in establishing the diagnosis.

According to the reviewed studies inspection of the neck posture is important; the forward head posture might be the most characteristic sign in CEH. The hyperextended position of the upper cervical joints could trigger CEH, as it has been discussed by Aprill et al. (32). A poor posture should indicate correction exercises and/or manipulative therapies. When the palpation or pressure of the nerves in the cervicocranial region is painful, therapy should start with local infiltration. The objectivity and sensitivity of manual diagnostic of the segmental or ZJ dysfunction in CEH has been published (10,12,20). These confirm earlier observation (33) that special manual PD is useful in the differential diagnostic of headaches originated from the cervical spine. If the pressure pain and special mobility tests on cervical segments and ZJs are positive, there is a choice whether infiltration or manipulative therapy should be used first.

The skin roll test, on the other hand, did not prove suitable in establishing the diagnosis of CEH. There is a controversy about the sensitivity of the palpation for MTPs in CEH. The “trigger point” is a specific definition for MTP and differs from that can be found in fibromyalgia (16). Jaeger’s finding (17) that MTPs correspond to the anatomical structures, which are under pressure in CEH, thus can be provoked, have not been supported and needs further investigations. When CEH is provoked by pressure on MTP, an infiltration should be administered.

The spasm and hypertrophy of the trapezius muscle and the weakness of the neck flexors, their reduced endurance capacities have been found characteristic physical findings in CEH. In our experience the unilaterally spasm of the suboccipital muscles on the painful side, which is always associated with the segmental and ZJ dysfunction, is also a characteristic sign. The effectiveness of exercises supports the aetiological role of both cervical joint and muscular dysfunctions (21;29).

Reduced ROM of the neck was found an essential physical finding in the diagnostic of CEH by all studies. The direction of movement restriction has been found different in the studies, which is also characteristic for the anatomical source and has consequences on treatment strategy. Restriction of movements however are secondary to an anatomical abnormality in the cervical spine (e.g. osteophyta, prolapsed disc, cervical joint dysfunction, muscular dysfunction, nerve compression, etc.) which may be irreversible or transitory. Furthermore the movement might be limited by the pain itself. More accurate PD should be, to examine e.g. the rotation with the neck in ante and retro flexion. Thus the movement restriction of upper, middle and lower cervical spine could be differentiate (10). The passive mobility tests for the segments and ZJs could give exact information on the level of impairment (8, 30), but this procedures need special skill.

In conclusion, according to the logistic of medical examination in CEH, the following PDs are recommended: 1. Inspection of the neck posture and the hypertrophy of muscles (trapezius). 2. Examination of muscle strength, especially the endurance capacity of neck flexors. 3. Active and passive ROM of the cervical spine, with attention to provocation of pain. 4. Pressure on special points for pain, especially the nerves in the occipital region and cervical joints (ZJ) and palpation of spasm in the trapezius muscle. 5. Special examinations of cervical segmental and ZJ mobility.

These procedures will be useful to locate the anatomical sources of CEH, which eventually will result in more adequate therapy.

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