Systematic review of randomized clinical trials of complementary/alternative therapies in the treatment of tension-type and cervicogenic headache.
Complement Ther Med 1999 Sep;7(3):142-55

Vernon H, McDermaid CS, Hagino C. Canadian Memorial Chiropractic College, Toronto, Canada.

OBJECTIVES: To conduct a systematic review of the randomized controlled clinical trials (RCTs) of complementary/alternative (CAM) therapies in the treatment of non-migrainous headache (i.e. excluding migraine, cluster and organic headaches). DESIGN: Systematic review with quality scoring and evidence tables. MAIN OUTCOME MEASURES: Number of RCTs per therapy, quality scores, evidence tables. RESULTS: Twenty-four RCTs were identified in the categories of acupuncture, spinal manipulation, electrotherapy, physiotherapy, homeopathy and other therapies. Headache categories included tension-type (under various names pre-1988), cervicogenic and post-traumatic. Quality scores for the RCT reports ranged from approximately 30 to 80 on a 100 point scale. CONCLUSION: RCTs for CAM therapies of the treatment of non-migrainous headache exist in the literature and demonstrate that clinical experimental studies of these forms of headache can be conducted. Evidence from a sub-set of high quality studies indicates that some CAM therapies may be useful in the treatment of these common forms of headache
The effectiveness of spinal manipulation for the treatment of headache disorders: a systematic review of randomized clinical trials.

Cephalalgia 2002 Oct;22(8):617-23

Astin JA, Ernst E. California Pacific Medical Center Research Institute, USA. john@integrativearts.com.

To carry out a systematic review of the literature examining the effectiveness of spinal manipulation for the treatment of headache disorders, computerized literature searches were carried out in Medline, Embase, Amed and CISCOM. Studies were included only if they were randomized trials of (any type of) spinal manipulation for (any type of) headache in human patients in which spinal manipulation was compared either to no treatment, usual medical care, a 'sham' intervention, or to some other active treatment. Two investigators independently extracted data on study design, sample size and characteristics, type of intervention, type of control/comparison, direction and nature of the outcome(s). Methodological quality of the trials was also assessed using the Jadad scale. Eight trials were identified that met our inclusion criteria. Three examined tension-type headaches, three migraine, one 'cervicogenic' headache, and one 'spondylogenic' chronic headache. In two studies, patients receiving spinal manipulation showed comparable improvements in migraine and tension headaches compared to drug treatment. In the 4 studies employing some 'sham' interventions (e.g. laser light therapy), results were less conclusive with 2 studies showing a benefit for manipulation and 2 studies failing to find such an effect. Considerable methodological limitations were observed in most trials, the principal one being inadequate control for nonspecific (placebo) effects. Despite claims that spinal manipulation is an effective treatment for headache, the data available to date do not support such definitive conclusions. It is unclear to what extent the observed treatment effects can be explained by manipulation or by nonspecific factors (e.g. of personal attention, patient expectation). Whether manipulation produces any long-term changes in these conditions is also uncertain. Future studies should address these two crucial questions and overcome the methodological limitations of previous trials.
A randomized controlled trial of exercise and manipulative therapy for cervicogenic headache.

Spine 2002 Sep 1;27(17):1835-43; discussion 1843

Jull G, Trott P, Potter H, Zito G, Niere K, Shirley D, Emberson J, Marschner I, Richardson C. Department of Physiotherapy, School of Health and Rehabilitation Sciences, University of Queensland, Brisbane, Australia. g.jull@shrs.uq.edu.au

STUDY DESIGN: A multicenter, randomized controlled trial with unblinded treatment and blinded outcome assessment was conducted. The treatment period was 6 weeks with follow-up assessment after treatment, then at 3, 6, and 12 months. OBJECTIVES: To determine the effectiveness of manipulative therapy and a low-load exercise program for cervicogenic headache when used alone and in combination, as compared with a control group. SUMMARY OF BACKGROUND DATA: Headaches arising from cervical musculoskeletal disorders are common. Conservative therapies are recommended as the first treatment of choice. Evidence for the effectiveness of manipulative therapy is inconclusive and available only for the short term. There is no evidence for exercise, and no study has investigated the effect of combined therapies for cervicogenic headache. METHODS: In this study, 200 participants who met the diagnostic criteria for cervicogenic headache were randomized into four groups: manipulative therapy group, exercise therapy group, combined therapy group, and a control group. The primary outcome was a change in headache frequency. Other outcomes included changes in headache intensity and duration, the Northwick Park Neck Pain Index, medication intake, and patient satisfaction. Physical outcomes included pain on neck movement, upper cervical joint tenderness, a craniocervical flexion muscle test, and a photographic measure of posture. RESULTS: There were no differences in headache-related and demographic characteristics between the groups at baseline. The loss to follow-up evaluation was 3.5%. At the 12-month follow-up assessment, both manipulative therapy and specific exercise had significantly reduced headache frequency and intensity, and the neck pain and effects were maintained (P < 0.05 for all). The combined therapies was not significantly superior to either therapy alone, but 10% more patients gained relief with the combination. Effect sizes were at least moderate and clinically relevant. CONCLUSION: Manipulative therapy and exercise can reduce the symptoms of cervicogenic headache, and the effects are maintained.
BACKGROUND: Non-invasive physical treatments are often used to treat common types of chronic/recurrent headache. OBJECTIVES: To quantify and compare the magnitude of short- and long-term effects of non-invasive physical treatments for chronic/recurrent headaches. SEARCH STRATEGY: We searched the following databases from their inception to November 2002: MEDLINE, EMBASE, BIOSIS, CINAHL, Science Citation Index, Dissertation Abstracts, CENTRAL, and the Specialised Register of the Cochrane Pain, Palliative Care and Supportive Care review group. Selected complementary medicine reference systems were searched as well. We also performed citation tracking and hand searching of potentially relevant journals. SELECTION CRITERIA: We included randomized and quasi-randomized controlled trials comparing non-invasive physical treatments for chronic/recurrent headaches to any type of control. DATA COLLECTION AND ANALYSIS: Two independent reviewers abstracted trial information and scored trials for methodological quality. Outcomes data were standardized into percentage point and effect size scores wherever possible. The strength of the evidence of effectiveness was assessed using pre-specified rules. MAIN RESULTS: Twenty-two studies with a total of 2628 patients (age 12 to 78 years) met the inclusion criteria. Five types of headache were studied: migraine, tension-type, cervicogenic, a mix of migraine and tension-type, and post-traumatic headache. Ten studies had methodological quality scores of 50 or more (out of a possible 100 points), but many limitations were identified. We were unable to pool data because of study heterogeneity. For the prophylactic treatment of migraine headache, there is evidence that spinal manipulation may be an effective treatment option with a short-term effect similar to that of a commonly used, effective drug (amitriptyline). Other possible treatment options with weaker evidence of effectiveness are pulsating electromagnetic fields and a combination of transcutaneous electrical nerve stimulation [TENS] and electrical neurotransmitter modulation. For the prophylactic treatment of chronic tension-type headache, amitriptyline is more effective than spinal manipulation during treatment. However, spinal manipulation is superior in the short term after cessation of both treatments. Other possible treatment options with weaker evidence of effectiveness are therapeutic touch; cranial electrotherapy; a combination of TENS and electrical neurotransmitter modulation; and a regimen of auto-massage, TENS, and stretching. For episodic tension-type headache, there is evidence that adding spinal manipulation to massage is not effective. For the prophylactic treatment of cervicogenic headache, there is evidence that both neck exercise (low-intensity endurance training) and spinal manipulation are effective in the short and long term when compared to no treatment. There is also evidence that spinal manipulation is effective in the short term when compared to massage or placebo spinal manipulation, and weaker evidence when compared to spinal mobilization. There is weaker evidence that spinal mobilization is more effective in the short term than cold packs in the treatment of post-traumatic headache. REVIEWERS’ CONCLUSIONS: A few non-invasive physical treatments may be effective as prophylactic treatments for chronic/recurrent headaches. Based on trial results, these treatments appear to be associated with little risk of serious adverse effects. The clinical effectiveness and cost-effectiveness of non-invasive physical treatments require further research using scientifically rigorous methods. The heterogeneity of the studies included in this review means that the results of a few additional high-quality trials in the future could easily change the conclusions of our review.
Medication-induced headache: overview and systematic review of therapeutic approaches.

Ann Pharmacother 1999 Jan;33(1):61-72

Zed PJ, Loewen PS, Robinson G. Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, Canada.

OBJECTIVE: To review medication-induced headache (MIH) through a systematic evaluation of the literature regarding the pharmacologic management of this condition. METHODOLOGY: To identify and evaluate all pharmacologic interventions for MIH, we conducted a qualitative systematic review of the English-language literature from 1966 to June 1998 using MEDLINE. The following search terms were used: chronic daily headache, transformed migraine, analgesic withdrawal headache, analgesic rebound headache, drug-associated headache, medication-induced headache, detoxification, and dihydroergotamine. In addition, a review of the references from relevant literature was also conducted to collect reports not identified in the MEDLINE search. RESULTS: Numerous therapies for acute management of MIH have been evaluated, although no rigorously conducted clinical trials were identified. Therapies evaluated include abrupt withdrawal of analgesics, initiation of dihydroergotamine, nonsteroidal antiinflammatory agents, methylergonovine, dihydroergotamine, sumatriptan, amitriptyline, dexamethasone, piracetam, prothipendyl, and valproate. Epidemiology, diagnosis, clinical features, pathophysiology, and long-term prognosis of therapy are discussed and therapeutic guidelines are offered. CONCLUSIONS: MIH is an underrecognized and difficult condition affecting headache-prone patients. The published literature concerning treatment of patients with MIH is scant and of poor quality, making it difficult for clinicians to decide on appropriate therapy. Recognition and treatment of MIH may lead to a long-term improvement in headache relief for many patients. It appears that complete withdrawal of the medications being overused is required for favorable long-term results.
Quality of life in migraine and chronic daily headache patients.

Cephalalgia 1998 Nov;18(9):638-43


Primary chronic headache can affect a patient's health-related quality of life (HQL). The Medical Outcomes Study Short Form (SF-36) questionnaire has been used to address this issue. We compare the impact of headache on the HQL of patients with migraine and chronic daily headache (CDH) using the SF-36 instrument. We analyzed a group of 115 consecutive patients; 62 migraine patients and 53 CDH patients completed the questionnaire. Patterns of disability were similar between the two groups, but CDH was marked by a lower level of health scales. Patients with CDH had a significantly worse pain score in physical functioning, role functioning (physical), bodily pain, general health perceptions, and mental health than patients with migraine headache. Our results in the migraine group were similar to findings in other publications, with the lowest scores in role functioning (physical) and bodily pain. There is no previous experience in CDH patients, but the present data suggest that the SF-36 questionnaire is valuable in determining the differences in functional status among headache types. These data suggest that the SF-36 is a reliable and valid measure of the HQL of patients with CDH, and may indeed prove to be valuable in studying the efficacy of therapeutic agents for this type of headache.
Medication-induced headache: overview and systematic review of therapeutic approaches.

Ann Pharmacother 1999 Jan;33(1):61-72

Zed PJ, Loewen PS, Robinson G. Faculty of Pharmaceutical Sciences, University of British Columbia, Vancouver, Canada.

Department of Internal Medicine II, Klinikum rechts der Isar, Technische Universität, Germany.

OBJECTIVE: To assess whether there is evidence that acupuncture is effective in the treatment of recurrent headaches. DESIGN: Systematic review. STUDY SELECTION: Randomized or quasi-randomized clinical trials comparing acupuncture with any type of control intervention for the treatment of recurrent headaches. DATA SOURCES: Electronic databases (Medline, Embase, Cochrane Field for Complementary Medicine, Cochrane Controlled Trials Register), personal communications and bibliographies. DATA COLLECTION AND ANALYSIS: Information on patients, interventions, methods, and results were extracted by at least two independent reviewers using a pretested form. A pooled estimate of the responder rate ratio (responder rate in treatment group/responder rate in control group) was calculated as a crude indicator of trial results as meta-analysis of more specific outcome data was impossible due to heterogeneity and insufficient reporting. RESULTS: Twenty-two trials, including a total of 1042 patients (median 36, range 10-150), met the inclusion criteria. Fifteen trials were in migraine patients, six in tension-headache patients, and in one trial patients with various headaches were included. The majority of the 14 trials comparing true and sham acupuncture showed at least a trend in favor of true acupuncture. The pooled responder rate ratio was 1.53 (95% confidence interval 1.11 to 2.11). The eight trials comparing acupuncture and other treatment forms had contradictory results. CONCLUSIONS: Overall, the existing evidence suggests that acupuncture has a role in the treatment of recurrent headaches. However, the quality and amount of evidence is not fully convincing. There is urgent need for well-planned, large-scale studies to assess effectiveness and efficiency of acupuncture under real life conditions.

Publication Types:
Meta-Analysis

PMID: 10595286 [PubMed - indexed for MEDLINE]
OBJECTIVES: The effect of massage therapy on chronic nonmigraine headache was investigated. METHODS: Chronic tension headache sufferers received structured massage therapy treatment directed toward neck and shoulder muscles. Headache frequency, duration, and intensity were recorded and compared with baseline measures. RESULTS: Compared with baseline values, headache frequency was significantly reduced within the first week of the massage protocol. The reduction of headache frequency continued for the remainder of the study (P = .009). The duration of headaches tended to decrease during the massage treatment period (P = .058). Headache intensity was unaffected by massage (P = .19). CONCLUSIONS: The muscle-specific massage therapy technique used in this study has the potential to be a functional, nonpharmacological intervention for reducing the incidence of chronic tension headache.
The efficacy of spinal manipulation, amitriptyline and the combination of both therapies for the prophylaxis of migraine headache.


Center for Clinical Studies, Northwestern College of Chiropractic, Bloomington, MN 55431, USA. cnelson@nwchiro.edu

BACKGROUND: Migraine headache affects approximately 11 million adults in the United States. Spinal manipulation is a common alternative therapy for headaches, but its efficacy compared with standard medical therapies is unknown. OBJECTIVE: To measure the relative efficacy of amitriptyline, spinal manipulation and the combination of both therapies for the prophylaxis of migraine headache. DESIGN: A prospective, randomized, parallel-group comparison. After a 4-wk baseline period, patients were randomly assigned to 8 wk of treatment, after which there was a 4-wk follow-up period. SETTING: Chiropractic college outpatient clinic. PARTICIPANTS: A total of 218 patients with the diagnosis of migraine headache. INTERVENTIONS: An 8-wk course of therapy with spinal manipulation, amitriptyline or a combination of the two treatments. MAIN OUTCOME MEASURES: A headache index score derived from a daily headache pain diary during the last 4 wk of treatment and during the 4-wk follow-up period. RESULTS: Clinically important improvement was observed in both primary and secondary outcomes in all three study groups over time. The reduction in headache index scores during treatment compared with baseline was 49% for amitriptyline, 40% for spinal manipulation and 41% for the combined group; p = .66. During the posttreatment follow-up period the reduction from baseline was 24% for amitriptyline, 42% for spinal manipulation and 25% for the combined group; p = .05. CONCLUSION: There was no advantage to combining amitriptyline and spinal manipulation for the treatment of migraine headache. Spinal manipulation seemed to be as effective as a well-established and efficacious treatment (amitriptyline), and on the basis of a benign side effects profile, it should be considered a treatment option for patients with frequent migraine headaches.

Publication Types:
Clinical Trial
Randomized Controlled Trial
Spinal manipulation vs. amitriptyline for the treatment of chronic tension-type headaches: a randomized clinical trial.


Boline PD, Kassak K, Bronfort G, Nelson C, Anderson AV.

Northwestern College of Chiropractic, Center for Clinical Studies, Minnesota, USA.

OBJECTIVE: To compare the effectiveness of spinal manipulation and pharmaceutical treatment (amitriptyline) for chronic tension-type headache. DESIGN: Randomized controlled trial using two parallel groups. The study consisted of a 2-wk baseline period, a 6-wk treatment period and a 4-wk posttreatment, follow-up period. SETTING: Chiropractic college outpatient clinic. PATIENTS: One hundred and fifty patients between the ages of 18 and 70 with a diagnosis of tension-type headaches of at least 3 months' duration at a frequency of at least once per wk. INTERVENTIONS: 6 wk of spinal manipulative therapy provided by chiropractors or 6 wk of amitriptyline treatment managed by a medical physician. MAIN OUTCOME MEASURES: Change in patient-reported daily headache intensity, weekly headache frequency, over-the-counter medication usage and functional health status (SF-36). RESULTS: A total of 448 people responded to the recruitment advertisements; 298 were excluded during the screening process. Of the 150 patients who were enrolled in the study, 24 (16%) dropped out: 5 (6.6%) from the spinal manipulative therapy and 19 (27.1%) from the amitriptyline therapy group. During the treatment period, both groups improved at very similar rates in all primary outcomes. In relation to baseline values at 4 wk after cessation of treatment, the spinal manipulation group showed a reduction of 32% in headache intensity, 42% in headache frequency, 30% in over-the-counter medication usage and an improvement of 16% in functional health status. By comparison, the amitriptyline therapy group showed no improvement or a slight worsening from baseline values in the same four major outcome measures. Controlling for baseline differences, all group differences at 4 wk after cessation of therapy were considered to be clinically important and were statistically significant. Of the patients who finished the study, 46 (82.1%) in the amitriptyline therapy group reported side effects that included drowsiness, dry mouth and weight gain. Three patients (4.3%) in the spinal manipulation group reported neck soreness and stiffness. CONCLUSIONS: The results of this study show that spinal manipulative therapy is an effective treatment for tension headaches. Amitriptyline therapy was slightly more effective in reducing pain at the end of the treatment period but was associated with more side effects. Four weeks after the cessation of treatment, however, the patients who received spinal manipulative therapy experienced a sustained therapeutic benefit in all major outcomes in contrast to the patients who received amitriptyline therapy, who reverted to baseline values. The sustained therapeutic benefit associated with spinal manipulation seemed to result in a decreased need for over-the-counter medication. There is a need to assess the effectiveness of spinal manipulative therapy beyond four weeks and to compare spinal manipulative therapy to an appropriate placebo such as sham manipulation in future clinical trials.
A randomized controlled trial of chiropractic spinal manipulative therapy for migraine.

J Manipulative Physiol Ther  2000 Feb;23(2):91-5

Tuchin PJ, Pollard H, Bonello R.

Department of Chiropractic, Macquarie University, New South Wales, Australia.

OBJECTIVE: To assess the efficacy of chiropractic spinal manipulative therapy (SMT) in the treatment of migraine. DESIGN: A randomized controlled trial of 6 months' duration. The trial consisted of 3 stages: 2 months of data collection (before treatment), 2 months of treatment, and a further 2 months of data collection (after treatment). Comparison of outcomes to the initial baseline factors was made at the end of the 6 months for both an SMT group and a control group. Setting: Chiropractic Research Center of Macquarie University.

PARTICIPANTS: One hundred twenty-seven volunteers between the ages of 10 and 70 years were recruited through media advertising. The diagnosis of migraine was made on the basis of the International Headache Society standard, with a minimum of at least one migraine per month. INTERVENTIONS: Two months of chiropractic SMT (diversified technique) at vertebral fixations determined by the practitioner (maximum of 16 treatments).

MAIN OUTCOME MEASURES: Participants completed standard headache diaries during the entire trial noting the frequency, intensity (visual analogue score), duration, disability, associated symptoms, and use of medication for each migraine episode.

RESULTS: The average response of the treatment group (n = 83) showed statistically significant improvement in migraine frequency (P < .005), duration (P < .01), disability (P < .05), and medication use (P < .001) when compared with the control group (n = 40). Four persons failed to complete the trial because of a variety of causes, including change in residence, a motor vehicle accident, and increased migraine frequency. Expressed in other terms, 22% of participants reported more than a 90% reduction of migraines as a consequence of the 2 months of SMT. Approximately 50% more participants reported significant improvement in the morbidity of each episode.

CONCLUSION: The results of this study support previous results showing that some people report significant improvement in migraines after chiropractic SMT. A high percentage (>80%) of participants reported stress as a major factor for their migraines. It appears probable that chiropractic care has an effect on the physical conditions related to stress and that in these people the effects of the migraine are reduced.

Publication Types:
  Clinical Trial
  Randomized Controlled Trial
Effectiveness of multidisciplinary intervention in the treatment of migraine: a randomized clinical trial.

Headache 2002 Oct;42(9):845-54

Lemstra M, Stewart B, Olszynski WP.

Department of Medicine, University of Alberta, Edmonton, Alberta.

OBJECTIVE: To test the effectiveness of a multidisciplinary management program for migraine treatment in a group, low cost, nonclinical setting. DESIGN: A prospective, randomized, clinical trial. BACKGROUND: Although numerous studies document the efficacy of pharmacological migraine management, it is unclear whether an effective long-term management approach exists. METHODS: Eighty men and women were randomly assigned to 1 of 2 groups. The intervention group consisted of a neurologist and physical therapist intake and discharge, 18 group-supervised exercise therapy sessions, 2 group stress management and relaxation therapy lectures, 1 group dietary lecture, and 2 massage therapy sessions. The control group consisted of standard care with the patient's family physician. Outcome measures included self-perceived pain intensity, frequency, and duration; functional status; quality of life; health status; depression; prescription and nonprescription medication use; and work status. Outcomes were measured at the end of the 6-week intervention and at a 3-month follow-up. Results.-Forty-one of 44 patients from the intervention group and all 36 patients from the control group completed the study. There were no statistically significant differences between the 2 groups before intervention. Intention to treat analysis revealed that the intervention group experienced statistically significant changes in self-perceived pain frequency (P = .000), pain intensity (P = .001), pain duration (P = .000), functional status (P = .000), quality of life (P = .000), health status (P = .000), pain related disability (P = .000), and depression (P = .000); these differences retained their significance at the 3-month follow-up. There were no statistically significant changes in medication use or work status. CONCLUSIONS: Positive health related outcomes in migraine can be obtained with a low cost, group, multidisciplinary intervention in a community based nonclinical setting.

Publication Types:
  Clinical Trial
  Randomized Controlled Trial
Cervicogenic headache: diagnostic evaluation and treatment strategies.


Biondi DM.

Pain Rehabilitation and Headache Management Programs, Spaulding Rehabilitation Hospital, 125 Nashua Street, Boston, MA 02114, USA. dbiondi@partners.org

Cervicogenic headache is a chronic, hemicranial pain syndrome in which the source of pain is located in the cervical spine or soft tissues of the neck but the sensation of pain is referred to the head. The trigeminocervical nucleus is a region of the upper cervical spinal cord where sensory nerve fibers in the descending tract of the trigeminal nerve converge with sensory fibers from the upper cervical roots. This convergence of upper cervical and trigeminal nociceptive pathways allows the referral of pain signals from the neck to the trigeminal sensory receptive fields of the face and head. The clinical presentation of cervicogenic headache suggests that there is an activation of the trigeminovascular neuroinflammatory cascade, which is thought to be one of the important pathophysiologic mechanisms of migraine. Another convergence of sensorimotor fibers has been described involving intercommunication between the spinal accessory nerve (CN XI), the upper cervical nerve roots, and ultimately the descending tract of the trigeminal nerve. This neural network may be the basis for the well-recognized patterns of referred pain from the trapezius and sternocleidomastoid muscles to the face and head. Diagnostic criteria have been established for cervicogenic headache but its presenting characteristics may be difficult to distinguish from migraine, tension-type headache, or hemicrania continua. A multidisciplinary treatment program integrating pharmacologic, nonpharmacologic, anesthetic, and rehabilitative interventions is recommended. This article reviews the clinical presentation of cervicogenic headache, its diagnostic evaluation, and treatment strategies.
This article reviews current literature on the role of manual medicine in the diagnosis and treatment of cervicogenic headache. Manual diagnostic procedures and treatment procedures are described for the cervical spine. Emphasis is placed on accurate diagnosis using a biomechanical model and precise localization of forces. Muscle energy technique is suggested as a safe and effective treatment when somatic dysfunction of the cervical spine is found in association with the diagnostic criteria for cervicogenic headache. Lastly, a suggested clinical approach to this problem from a manual medicine perspective is given.

Role of Manual Medicine

Manual medicine has a distinctive role in the diagnosis and treatment of cervicogenic headache. Performing a focused structural examination assessing segmental motion for asymmetry, altered range of motion, and tissue texture abnormality allows one to make a physical diagnosis of mechanical dysfunction. In the osteopathic profession, this trio of physical findings on examination is the diagnostic criteria for somatic dysfunction [1]. This is defined as impaired or altered function of related components of the somatic (body framework) system; skeletal, arthrodial, and myofascial structures; and related vascular, lymphatic, and neural elements, and is the entity that is treated with manipulation procedures. A review of the literature on cervicogenic headache reveals a number of articles defining the anatomic basis of headache arising from elements of the upper cervical spine segments [2, 3, 4*, 5, 6, 7]. The usual rationale for the use of manual medicine has been the structure-function interrelationship. Thus, most authors begin by defining the anatomy and nociceptors associated with the region in question, and then blithely make the jump to the assumption that abnormal function of the anatomy can be a cause of pain, thereby justifying a manipulative approach with the goal of treatment being the re-establishment of "normal" motion to the affected anatomic structures. There are now several studies that have begun to test this hypothesis to establish an accurate diagnosis [8] and to evaluate the effects of manipulative treatment specifically on cervicogenic headache [9, 10, 11, 12, 13].

Diagnosis

Although relatively strict, there is nearly universal acknowledgement of the diagnostic criteria described by Sjaastad [14], established by the Headache Classification Committee of the International Headache Society [15], and discussed in detail elsewhere in this issue. In reviews and studies on this subject, there is ample discussion of the difficulties inherent in making an accurate diagnosis [16**]. The reality of clinical practice is that 1) symptoms overlap significantly between different kinds of headaches, 2) over time the patients’ symptoms can wax and wane and change in character, and 3) as many clinicians will recognize, patients often have more than one type or kind of headache. The patient will often be able to clearly describe the differentiating characteristics of the different symptoms they experience.

There is an additional factor that is helpful in establishing the diagnosis, but is not listed in the original criteria. The findings of a specific physical examination of the regional and segmental mobility of the upper cervical complex, done with care and knowledge of the anatomy and available movements of the different segments involved, can reveal several important clues to diagnosis and help predict the type of treatment appropriate for that patient. Reproduction of pain by palpation of a specific area in the cervical spine, the ability to precipitate attacks with certain active motions of the neck, and unilaterality with frequent radiation into the ipsilateral shoulder and arm are all aspects that suggest the diagnosis of cervicogenic headache. A focused physical examination allows confirmation and greater precision in making the diagnosis, and just as importantly, assisting one with the plan for treatment.
Two characteristics of the examination that are believed to correlate with the diagnosis have been discussed by Vernon et al. [17]. The authors found abnormalities in all 30 subjects with headache in their study by investigating passive accessory intervertebral movements of the first three cervical vertebrae, as described by Maitland [18]. These included movement restrictions and production of local pain. In addition, a forward head posture and decreased isometric strength and endurance of the upper cervical flexors were observed more frequently in the symptomatic population than in the controls.

The procedures for making this type of assessment are described in several texts spanning the broad array of disciplines that incorporate manual medicine into their scope of practice. This article describes the assessment as performed and taught in the osteopathic profession. Although there are differences in methods, what this author has noted in 18 years of interaction with well over 2000 continuing education students from widely disparate backgrounds and several different countries, is that there are more similarities in this examination than differences between methods. It seems personalities perpetuate distinction between professions and even factions within professions more than the methods themselves. As Butler [19] describes in his new book, we are currently experiencing a merging and drawing together period in the field of manual medicine, and an incorporation of rehabilitation principles that involve active exercise-based movements as well as the more passive procedures usually associated with manual medicine.

### Diagnostic Examination Procedures

In addition to a neurologic examination and when appropriate, radiographic studies, the structural examination allows one to assess the biomechanical function of the neuromusculoskeletal system. When the structural pathology is correlated with the functional deficits, a clearer picture of the patient's status emerges. Emphasis is placed on diagnostic procedures because an accurate assessment of function is a key element in patient selection. Cervicogenic headache, when associated with moderate to severe motion loss in the upper three cervical segments, responds quite favorably to manipulative intervention. One should start with a screening examination of the musculoskeletal system, being aware of the highly interactive and dynamically interdependent qualities of the human body. It is rare for dysfunction to be confined to only one region, and the clinician needs to assess qualitative and quantitative differences within the system and determine the relevance of the findings. Do they correlate with pathology? Do they relate to the patients' symptomatology?

Assessment begins with observation for asymmetries and limitations of active motion. Palpation of the tissues follows, and can be performed with the patient seated or supine. The supine position affords the clinician easier access to the deeper cervical musculature between the longus capitis and semispinalis capitis muscles posteriorly, where one can learn to project their palpatory sense through the soft tissues to the articular pillars of the cervical vertebrae. Once here, note is made of any palpable hypertonicity of the deeper musculature, and any increase in tone or tension in the soft tissues surrounding the zygapophyseal joints. In patients with cervicogenic headache and concomitant somatic dysfunction, the degree of tissue texture abnormality in these structures is marked and readily palpated when using this type of examination procedure.

Assessment continues with passive motion testing. The typical cervical segments (C2/3-C6/7) are evaluated by translating the articular pillars laterally in both an extended and flexed position. This allows one to assess the range and quality of motion of each facet to open (flexion) and close (extension). For instance, if one lifts C3, translating it anteriorly with respect to C2 and C4, and then, with contact on the articular pillars, translates C3 to the right, one is assessing the ability of the segment to close on the left side, or sidebend to the left. Because typical cervical segments are known to exhibit coupled motion with rotation and sidebending occurring to the same side at all times [20], testing for both rotation and sidebending is probably redundant. One then compares this with translation to the left, maintaining the extension (anterior translation of C3). This similarly assesses the ability of the segment to sidebend to the right, the direction of movement that causes closure of the right facet. In order to have a frame of reference, one then tests the segment below in the same way.

Some confusion exists about which vertebral motion segment is being tested: is the maneuver in the example above testing the behavior of C3 with respect to C4 or is it testing the behavior of C3 with respect to C2? The answer lies in the way the clinician performs the procedure. If one uses a technique where the hands create a splinting effect on the segments above the one being tested by spanning the upper cervical complex and include the cranium in the hold, then the segment being tested is C3 on C4 (Fig. 1). By convention, in the field of biomechanics, spinal motion of a vertebra is always described with respect to the segment immediately below. This serves to maintain a frame of reference for describing motion. Also by convention, rotation is described based on the relative position of the anterior surface of the vertebral body with respect to the anterior surface of the vertebral body of the segment below.
It is imprecise and incorrect to use nomenclature like "C3 is anterior," or "C2 is rotated left" without the mention of a frame of reference. All motion can then be described as a combination of translation in the three cardinal planes of the body and rotation about the three primary axes of the rectangular coordinate system used in biomechanics. The motions available are then combinations of flexion and extension (sagittal plane, horizontal axis), sidebending right and left (coronal plane, anterior-posterior axis), and rotation right and left (horizontal plane, vertical axis). This is shown in Figure 2.

If one does find an asymmetry in motion, particularly when coupled with tissue texture abnormality at that level, it can be described as a motion restriction. The convention that is commonly used by patients and some caregivers that a vertebra is "out of place" is not accurate. If it were truly "out of place," the appropriate person to assess the patient is a spine surgeon, and paralysis would be likely. What more accurately describes the behavior of the segment is a description of where the motion loss occurs. For example, saying that C2 resists sidebending to the right in the extended position means that when tested, C2 would not translate as far to the left when taking the segment into extension (anterior translation) as it did to the right when compared to C3. Figure 3 shows the coordinate system as it applies to a cervical vertebra; the anterior surface is facing us in this picture.

Motion testing for the atlantoaxial joint is accomplished by flexing the head and neck to approximately 45˚, and then rotating the head to the right and left, monitoring with the hands placed on the lateral masses of C1 and the articular pillars of C2. Recall the primary motion at this segment is rotation, and one assesses for alterations in range of motion, tissue texture abnormality, and quality of motion (Fig. 4).
At the occipitoatlantal joint, motion is coupled with sidebending and rotation always occurring to opposite sides. The primary motions of this joint are flexion and extension. In flexion, the condyles slide posteriorly and laterally on the superior surface of the atlas. In extension, the condyles slide anteriorly and medially on the superior surface of the atlas. There are several ways to motion test this joint. The most straightforward approach is to test it in the same way as the typical cervicals, translating to the right and left in a flexed position to assess posterior movement of the condyles, and translating to the right and left in an extended position to assess anterior movement capability of the condyles.

**Figure 4**

Doctor testing the motion of C1-C2. Patient's head is flexed, rotated right (A), then flexed, then rotated left (B).

View larger images [4A, 4B]

**Figure 5**

Doctor testing C0-C1. Head is flexed, translated right, then left. In this picture, the contact is on the skull instead of on the cervical spine.

View larger image

With extension of the occiput on the atlas, translation to the right asks the following question: can the left occipital condyle translate anteriorly? Left translation allows one to relatively isolate anterior translation of the right occipital condyle. Posterior translation, which is more often restricted with suboccipital muscle hypertonicity, is assessed by flexing the occiput on the atlas, and translating right, and then translating left. Translation to the right asks if the right condyle can move posteriorly, and translation to the left asks if the left condyle can move posteriorly. A diagnosis of motion restriction can then be made if it is present (Fig. 5).

For readers who are not familiar with segmental motion testing, it may surprise you to discover it is not as difficult as it sounds. The hands are very sensitive instruments. Coupled with observation, palpation can help one make a quantum leap from making assumed musculoskeletal diagnoses based on symptoms to being able to precisely describe the behavior of spinal motion segments. When the symptoms, signs, and physical findings correlate well with one another, there is a strong likelihood that improving mobility of the segments involved will also decrease or even eliminate the patients' symptoms. Further instruction on the role of diagnostic procedures in manual medicine and interpretation of findings in the cervical spine can be found in several texts [21, 22, 23, 24, 25, 26].

**Treatment**

There are several treatment procedures in the realm of manual medicine that can be applied to the cervical spine. They range from soft tissue massage to mobilization with impulse using a high velocity, low amplitude thrust technique. The upper cervical spine is a difficult region to treat. It is influenced by a great number of factors, with strong contributions from postural imbalances and affective components of pain [27]. An emphasis should be
placed on treatment of the entire neuromusculoskeletal system, understanding the concept of the body as a
dynamic, interactive, functional unit. Maximal function within the limitations of the individuals' anatomy and
capabilities should be sought. A person with postural imbalances from disorders such as lumbar spinal stenosis
and osteoarthritis of the hip will have an ambulatory dysfunction that will be accompanied by compensatory
changes in the upper cervical spine. One of the most common associations with cervicogenic headache is a
forward head posture. Therefore, treatment is directed toward the cervical region taking into account the context
of how it affects and is affected by the rest of the body.

Until now, the issue of which tissue is involved in creating or maintaining somatic dysfunction has been
deliberately avoided. The upper cervical region, indeed, the whole spine, can be evaluated and behavior of each
motion segment can be described without this knowledge. However, it is part of the clinician's job to attempt to
identify the structure that is creating the patient's headache. Is the offending structure the facet joint, the joint
capsule, the ligaments that support the joint, the muscles that move the joint, the tone of the nerves that supply
the joint, or the effect of impaired arterial supply and reduced venous and lymphatic drainage from the region? All
of these mechanisms have been postulated, and others as well. This is a difficult question, and there are only a
few accepted gold standards by which one can narrow the differential diagnosis.

Fluoroscopically guided joint blockade with a local anesthetic agent has become a method by which to make a
determination about the joint itself as a pain generator [6, 7]. Blockade of the third occipital nerve using
bupivacaine or lignocaine [28], surgical decompression of the second occipital nerve [29, 30], and blockade of the
greater occipital nerve [31] have been studied. Pikus and Phillips [29] report a 90% success rate with the
decompression technique, and note in their operative findings venous compression of C2 in 86% of the cases, a
scared and thickened dorsal atlanto-epistrophic ligament in 66% of the cases, and rostral distortion of the root in
49% of the cases (N = 27). Further, they relate "findings on physical examination beyond those that establish the
syndrome were not predictive of outcome" [30]. However, the examination procedure is not discussed. Range of
motion testing is mentioned in the discussion of criteria, but it was only noted that 37% of the subjects had pain on
range of motion testing.

In the trials mentioned earlier that assess the influence of manipulation on outcome in patients with cervicogenic
headache [8, 9, 10, 11, 12, 13], it appears that increases in range and quality of motion in the upper three cervical
segments have a positive influence on outcome. In a review of the literature on manipulation and mobilization of
the cervical spine published in Spine [32], the authors make the following conclusions: It is apparent from the
quality and quantity of studies reviewed in the current article that much more high quality research needs to be
done before more definitive recommendations can be made regarding the use of manipulation or mobilization for
neck pain and headache. Analysis of the existing data has led the authors to conclude that 1) mobilization is
probably of at least short-term benefit for patients with acute neck pain; 2) manipulation is probably slightly more
effective than mobilization or physical therapy for some patients with subacute or chronic neck pain (and all three
treatments are probably superior to usual medical care); and 3) manipulation and/or mobilization may be
beneficial for muscle tension headache.

Most of the trials concerning manipulation of the cervical spine were done without using controls and did not
specify how the patient was treated. None of them specified how the manipulable lesion was diagnosed.
Effectiveness of treatment cannot be established until the method of coming to a diagnosis is described and
validated. This is more easily said than done. It has not been lack of effort that is responsible for the fact that
diagnostic procedures in most aspects of physical examination lack validation studies. It seems more to be the
"nature of the beast." However, the very least an investigator should provide is a detailed description of the
procedure used.

Selection of manual medicine techniques for the upper cervical spine relates to the previous discussion in the
following way. One attempts to apply the method that most directly addresses the component of the anatomy that
seems to be the restrictor of motion. If one's palpatory sense picks up a hard, early end feel to the range of motion
and tissue texture abnormality around the joint capsule, a procedure addressing the joint would be appropriate. If
on the other hand, there is an edematous, boggy feel to the musculature in the suboccipital region, and the end of
range has a more gradual increase in resistance to motion, a technique using muscles to mobilize the area would
be appropriate.

The safest approach for this region is to use muscle energy techniques, which have different names in different
professions, but share the following characteristics. They use the patient's intrinsic activating force of muscle
contraction to achieve a variety of outcomes, which include 1) restoration of joint mobility, 2) restoration toward
more symmetric muscle balance in all planes, and 3) reduction of passive congestion in and through the areas
being treated. They are particularly useful when hypertonicity of the musculature is present, and seems to be
contributing to the motion restriction [33]. They are classified as direct techniques because the operator engages
the barrier in the direction of the motion restriction, i.e., if the segment resists left rotation, left sidebending, and
extension, the operator takes the segment to the end of range in each of the three planes of motion. He or she then asks the patient to contract the hypertonic muscles, which in this case would be the muscles that accomplish right rotation, right sidebending, and flexion, and resists the effort for 3 to 5 seconds, allowing no movement to occur. This is an isometric contraction. Following this, one can advance the segment further to a new barrier, which is closer to normal range. A series of contractions followed by relaxation and repositioning of the segment is used, and then the segment is retested to see if motion has been restored to that segment. A reliable indicator of a successful procedure is a change in the tone of the muscles, from abnormal tension and texture, to normal palpatory findings. This usually occurs immediately after or during the procedure.

An advantage of muscle energy techniques is that they completely avoid placement of the cervical spine into a position of hyperextension and rotation in either direction. This position has been acknowledged to be one of possible danger, particularly when performing a high velocity, low amplitude thrust [34**, 35, 36, 37, 38, 39, 40]. The danger is to the vertebral artery, and to some extent, the internal carotid artery. The mechanism of injury is a tear of the intimal lining of the vertebral artery usually where it turns to enter the cervical spine between the 6th and 7th vertebrae, or where it passes over the posterior aspect of the arch of C1 before it turns to pierce the atlantal-occipital membrane to enter the skull. A thrombus can form from the tear and move upward through the artery until it lodges somewhere in the posterior circulation of the brain and causes an ischemic stroke. Because there are no premanipulative tests that will accurately predict which patient would be susceptible to such an injury [41, 42], it is advisable to use techniques that avoid the position.

Modifications for treatment of the upper cervical spine with muscle energy procedures are used to accommodate the unique motion characteristics found at these levels. At C1-C2, the primary motion tested and treated is rotation. The restrictive barrier is engaged by flexing the head and neck on the trunk to reduce mobility of the typical cervical segments from below and by introducing rotation of the head and upper cervical complex toward the side of restriction. Once the barrier is engaged, the patient is instructed to attempt to turn their head in the opposite direction while the operator prevents movement. Upon relaxation, the operator adds motion in the direction of the restriction as the tissues allow, and repeats the procedure two or three times, finally retesting to see if symmetry is attained.

At C0-C1, either a flexion or extension component is coupled with sidebending and rotation restriction to opposite sides. The operator grasps the head gently with one hand holding the chin, and the other holding the occiput. The head is then taken to the barrier to motion by either flexing or extending to the point of restriction, and then sidebending is introduced in the direction of restriction as well. In order to know when the barrier is engaged, one must monitor the C0-C1 joint with the posterior hand. Due to the unique architecture of this joint, rotation will couple in the opposite direction without the need for operator guidance. This can be observed by watching the chin as one tilts the head to one side. The chin will move away from midline in the direction opposite to the sidebending. Then one requests the patient to engage the muscles restricting movement. This will require the patient to push their head in the direction 180˚ or right rotation, right sidebending, and flexion, and resists the effort for 3 to 5 seconds, allowing no movement to occur.

Clinical ‘Pearls’

In a manual medicine practice, experience with this type of headache accumulates quickly. Although the majority of patients are adults, on occasion, a child will present with this type of problem. Most frequently for children, it is an episode of waking up with a wryneck that does not fully resolve. Treatment of muscles and soft tissues usually resolves the problem. In adolescents, cervicogenic headache is more prevalent than in children and is frequently associated with whiplash injuries in motor vehicle accidents, and roller coaster riding.

For the most part, a manual medicine approach to the problem of cervicogenic headache is rewarding in that treatment rarely requires more than 10 visits, with the first few visits primarily focused on restoration of motion in the involved areas. The next few visits are directed at restoring postural balance, kinesthetic awareness, and insight into why this may have become a chronic problem for the patient. Once the patient has self-management tools on board and feels confident in their use, he or she can be discharged. Occasionally, they return for manipulative treatment when they have a re-emergence of symptoms and cannot overcome them with the exercises they have learned. At that point, motion is assessed, restored, and the exercise prescription is reviewed, changed if necessary, and effort is made to reinforce the patient's self-efficacy. It is important to avoid the trap of making the patient feel dependent on the clinician for relief. There are many ways to maintain posture, flexibility, motor control, strength, and endurance, and they all involve the patient. Empowering the patient to realize this and learn to manage their problem more effectively on their own is the essential element in the
rehabilitative process. The manipulative aspect is simply the impetus often needed to get motion to occur again in
a normal way so that the person can achieve improvement in function and experience relief from the untoward
effects of suboptimal mechanics.

On the other hand, the presence or absence of somatic dysfunction does not always accompany pain. If manual
medicine procedures do not succeed in improving symptoms after a few visits, then it is not reasonable to keep
trying. If there is no somatic dysfunction associated with the patient's pain, manipulation is not indicated. In
addition, sometimes motion improves without improvement in symptomatology. Six is generally a reasonable
number of visits to give oneself in order to see if manual procedures will improve the patient's condition. If it has
not been successful, it is appropriate to help the patient find another form of treatment that is more likely to be of
benefit to them, many of which are described elsewhere in this issue.

Conclusions

Manual medicine has a distinctive role in the management of cervicogenic headache. A focused segmental
physical examination of the typical cervical segments and the upper cervical complex is possible, and significantly
improves the clinician's ability to assess the functional aspect of this problem. In this way, the structural pathology
and functional behavior of the cervical spine can be described with greater precision, which assists with
diagnosis, prognosis, and the choice of treatment method. Structural diagnosis is accomplished by applying
observation, active range of motion assessment, and passive motion testing of the joints involved. The presence
of tissue texture abnormality helps to confirm the diagnosis of somatic dysfunction, which is the entity that is
treated with mobilization or manipulation.

Treatment is directed toward restoration of motion in all planes of each segment involved, and requires a
thorough knowledge of the anatomy and kinematics of the spine. In addition, teaching the patient about posture,
kinesthetic awareness, and knowledge of muscle stretches and strengthening exercises, assists in improving the
outcome over manipulation alone, and appears to reduce recurrence. Muscle energy technique is safe in the
cervical spine, and uses the patient's own intrinsically derived forces against an unyielding counterforce controlled
by the clinician to mobilize joints, balance muscles to symmetry, and relieve passive congestion of the soft
tissues. A trial of manual medicine is appropriate in the patient with cervicogenic headache who has
accompanying somatic dysfunction that correlates with their symptomatology.

References and Recommended Reading

Recently published papers of particular interest have been highlighted as:

* Of importance
** Of major importance


2. Bogduk N: *Cervical causes of headache and dizziness*. In *Grieve's
Modern Manual Therapy*. Edited by Boyling JD, Palastanga N. New York:

▶ View the PubMed notation for this reference.


Reports a new anatomic finding: a direct connection between the dura mater and a suboccipital muscle (rectus capitis posterior minor) supplied by the C1 motor nerve root.

▶ View the PubMed notation for this reference.


▶ View the PubMed notation for this reference.


▶ View the PubMed notation for this reference.


▶ View the PubMed notation for this reference.


15. **Classification and diagnostic criteria for headache disorders, cranial neuralgias and facial pain.** Headache Classification Committee of the International Headache Society [no authors listed]. *Cephalalgia* 1998, **8**(suppl 79):1-96.


   The most recent and best review on the subject of diagnosis. It is clearly written, well organized, and comprehensive, and provides a particularly good section on the neuroanatomic basis for this diagnosis.


   View the PubMed notation for this reference.


   A benchmark paper that is the most authoritative, clearly written, and well-referenced paper on this subject. Engineering principles are discussed in terms that are understandable to a clinician.


☆ View the PubMed notation for this reference.

> View the PubMed notation for this reference.


> View the PubMed notation for this reference.


> View the PubMed notation for this reference.


> View the PubMed notation for this reference.


> View the PubMed notation for this reference.

34. Di Fabio RP: **Manipulation of the cervical spine: risks and benefits.** *Phys Ther* 1999, **79**:50-65.

A comprehensive review of the complications that have been encountered with manual treatment of the cervical spine. It covers the subject the most thoroughly and has the most extensive reference list.

View the PubMed notation for this reference.


View the PubMed notation for this reference.

36. Haldeman S: **Vertebrobasilare dissektion nach zervikalem trauma und wirbelsaumenmanipulation: risikofaktoren und vorangehende halsbewegungen** [article in German, abstract available in English]. *Manual Medizin* 2000, **38**:3-16.


View the PubMed notation for this reference.

38. Senstad O: **Frequency and characteristics of side effects of spinal manipulative therapy.** *Spine* 1997, **22**:435-441.

View the PubMed notation for this reference.

39. Toole JF: **Influence of head position upon cerebral circulation.** *Arch Neurol* 1960, **2**:616-623.

View the PubMed notation for this reference.
Cervicogenic Headache: Diagnostic Evaluation and Treatment Strategies

by David M. Biondi, DO

Cervicogenic headache is a chronic, hemicranial pain syndrome in which the source of pain is located in the cervical spine or soft tissues of the neck but the sensation of pain is referred to the head. The trigeminocervical nucleus is a region of the upper cervical spinal cord where sensory nerve fibers in the descending tract of the trigeminal nerve converge with sensory fibers from the upper cervical roots. This convergence of upper cervical and trigeminal nociceptive pathways allows the referral of pain signals from the neck to the trigeminal sensory receptive fields of the face and head. The clinical presentation of cervicogenic headache suggests that there is an activation of the trigeminovascular neuroinflammatory cascade, which is thought to be one of the important pathophysiologic mechanisms of migraine. Another convergence of sensorimotor fibers has been described involving intercommunication between the spinal accessory nerve (CN XI), the upper cervical nerve roots, and ultimately the descending tract of the trigeminal nerve. This neural network may be the basis for the well-recognized patterns of referred pain from the trapezius and sternocleidomastoid muscles to the face and head. Diagnostic criteria have been established for cervicogenic headache but its presenting characteristics may be difficult to distinguish from migraine, tension-type headache, or hemicrania continua. A multidisciplinary treatment program integrating pharmacologic, nonpharmacologic, anesthetic, and rehabilitative interventions is recommended. This article
reviews the clinical presentation of cervicogenic headache, its diagnostic evaluation, and treatment strategies.

Introduction

Chronic daily as well as refractory intermittent head or face pain can be a perplexing medical disorder, especially when it is not recognized that the pain actually originates in the cervical spine or soft tissues of the neck. Head pain referred from the neck has been designated cervicogenic headache [1]. It is often a sequela of head or neck injury but may also occur in the absence of trauma. Cervicogenic headache is a diagnosis that lacks expert consensus with respect to its acceptance as a distinct medical disorder [2]. The condition's pathophysiology and source of pain are debated [2, 3, 4*]. Muscular, neurogenic, osseous, articular, and vascular sources for pain referred to the head have been described in the medical literature [5**]. In clinical practice, pain that is referred to the head most often originates from more than one anatomic source, not only from one patient to another but in the individual patient who presents with this condition.

Further confounding the medical practitioners' ability to derive a diagnosis of cervicogenic headache is the similarity of its clinical presentation to that of primary headache disorders such as migraine, cluster, chronic paroxysmal hemicrania, hemicrania continua, and tension-type headache. Activation of proinflammatory pathways, release of proinflammatory cytokines, and an increase in nitric oxide formation has been demonstrated in patients with cervicogenic headache [6*]. Because primary headache disorders may present with coexisting neck pain and tenderness as an epiphenomenon of their pathophysiology [7], neck pain associated with headache is not pathognomonic for the diagnosis of cervicogenic headache. Successful treatment of this condition requires an accurate diagnosis and a multidisciplinary pain management program.

Diagnostic Criteria

Efforts have been made to develop a set of diagnostic criteria for head and face pain, which are a consequence of neck disorders [8, 9*]. The development and acceptance of a single diagnostic format for cervicogenic headache has been an item of debate. The Cervicogenic Headache International Study Group and the International Headache Society (IHS) have each proposed diagnostic guidelines that differ in their criteria to define this condition. Tables 1 and 2 outline and contrast these sets of diagnostic criteria.

Table 1: The Cervicogenic Headache International Study Group

Major criteria of cervicogenic headache
1. Symptoms and signs of neck involvement:
   a. Precipitation of head pain, similar to the usually occurring one:
      1. By neck movement and/or sustained awkward head positioning, and/or:
      2. By external pressure over the upper cervical or occipital region on the symptomatic side
   b. Restriction of the range of motion in the neck
   c. Ipsilateral neck, shoulder, or arm pain of a rather vague nonradicular nature or, occasionally, arm pain of a radicular nature

   Points (I) (a through c) are set forth in a surmised sequence of importance. It is obligatory that one or more of the phenomena in point (I) are present. Point (a) suffices as the sole criterion for positivity within group (I); points (b) or (c) do not. Provisionally, the combination of (I) (b and c) has been set forth as a satisfactory combination within (I). The presence of all three points (a, b, and c) fortifies the diagnosis (but still point (II) is an additional obligatory point for scientific work).
2. Confirmatory evidence by diagnostic anesthetic blockades
Point (II) is an obligatory point in scientific works

III. Unilaterality of the head pain, without sideshift

For scientific work, point (III) should preferably be adhered to

Head pain characteristics

IV. a. Moderate-severe, nonthrobbing, and nonlancinginating pain, usually starting in the neck
b. Episodes of varying duration, or
c. Fluctuating, continuous pain

Other characteristics of some importance

V. a. Only marginal effect or lack of effect of indomethacin
b. Only marginal effect or lack of effect of ergotamine and sumatriptan
c. Female sex
d. Not infrequent occurrence of head or indirect neck trauma by history, usually of more than only medium severity

None of the single points under (IV) and (V) are obligatory

Other features of lesser importance

VI. Various attack-related phenomena, only occasionally present:
a. Nausea
b. Phonophobia and photophobia
c. Dizziness
d. Ipsilateral "blurred vision"
e. Difficulties on swallowing
f. Ipsilateral edema, mostly in the periocular area

(From Sjaastad et al. [9*].)

The Cervicogenic Headache International Study Group criteria [9*] provide a more detailed description of the condition in a way that can be useful to the clinical practitioner. Radiographic evidence is not required in these criteria, although imaging procedures are necessary for practical reasons to uncover any underlying pathology that may require surgery or other invasive interventions. In these criteria a confirmatory anesthetic blockade is suggested to be obligatory for scientific work. In the clinic setting, however, the diagnosis of cervicogenic headache can be derived on clinical grounds by careful history and physical examination without anesthetic blockade (Table 3), but diagnostic blockade is usually necessary for practical reasons because the patient's response will direct a therapeutic course of action.

Table 2: International Headache Society criteria for headache associated with disorder of the neck

Category 11. Headache or facial pain associated with disorder of the cranium, neck, eyes, nose, sinuses, teeth, mouth, or other facial or cranial structures

11.2 Neck

Comment: Cervicogenic headache not fulfilling 11.2.1 or 11.2.2 is not sufficiently validated

11.2.1 Cervical spine

Diagnostic criteria:
A. Pain localized to the neck and occipital region. May project to forehead, orbital region, temples, vertex, or ears
B. Pain is precipitated or aggravated by special neck movements or sustained neck posture
C. At least one of the following:
   1. Resistance to or limitation of passive neck movements
   2. Changes in neck muscle contour, texture, tone, or response to active and passive stretching and contraction
   3. Abnormal tenderness of neck muscles
D. Radiologic examination reveals at least one of the following:
   1. Movement abnormalities in flexion/extension
   2. Abnormal posture
   3. Fractures, congenital abnormalities, bone tumors, rheumatoid arthritis, or other distinct pathology (not spondylosis or osteochondrosis)
Comment: Cervical headaches are associated with movement abnormalities in cervical intervertebral segments. The disorder may be located in the joints or ligaments. The abnormal movement may occur in any component of intervertebral movement, and is manifest during either active or passive examination of the movement.

11.2.2 Retropharyngeal tendonitis

(From [8].)

Table 3: Clinical characteristics of cervicogenic headache

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unilateral head or face pain without sideshift; the pain may occasionally be bilateral (unilateral on both sides)</td>
<td></td>
</tr>
<tr>
<td>Pain localized to the occipital, frontal, temporal, or orbital regions</td>
<td></td>
</tr>
<tr>
<td>Moderate to severe pain intensity</td>
<td></td>
</tr>
<tr>
<td>Intermittent attacks of pain lasting hours to days, constant pain, or constant pain with superimposed attacks of pain</td>
<td></td>
</tr>
<tr>
<td>Pain is generally deep and nonthrobhbing in character; throbbing may occur when migraine attacks are superimposed</td>
<td></td>
</tr>
<tr>
<td>Head pain is triggered by neck movement, sustained or awkward neck postures; digital pressure to the suboccipital, C2, C3, or C4 regions or over the greater occipital nerve; valsala, cough, or sneeze may also trigger pain</td>
<td></td>
</tr>
<tr>
<td>Restricted active and passive neck range of motion; neck stiffness</td>
<td></td>
</tr>
<tr>
<td>Associated signs and symptoms can be similar to typical migraine accompaniments including nausea, vomiting, photophobia, phonophobia and dizziness; others include ipsilateral blurred vision, lacrimation, and conjunctival injection or ipsilateral neck, shoulder, or arm pain</td>
<td></td>
</tr>
</tbody>
</table>

The clinical features of cervicogenic headache may overlap or mimic those of primary headache disorders such as migraine, cluster, chronic paroxysmal hemicrania, hemicrania continua, or tension-type headache. There are often one or more clinical characteristics that can be used to differentiate each of these headache types from one another but the distinction may at times be difficult (Table 4). Using the diagnostic criteria established by the IHS and Cervicogenic Headache International Study Group appears to provide a means by which an accurate headache diagnosis can be determined [10]. A comprehensive history, review of systems, and physical examination including a complete neurologic assessment will often identify an underlying structural or systemic disease if present, but diagnostic testing is usually required for confirmation [11].

Diagnostic Testing

Cervical nerve or zygapophyseal joint blockade is required to confidently render a diagnosis of cervicogenic headache. The first three cervical spinal nerves and their rami are the primary peripheral neurogenic sources that can refer pain to the head. The suboccipital nerve (dorsal ramus of C1) innervates the atlanto-occipital joint; therefore, pathology or injury affecting this joint is a potential source for head pain that is typically experienced in the occipital region. The C2 spinal nerve and its dorsal root ganglion has a close anatomic proximity to the lateral capsule of the atlantoaxial (C1-2) zygapophyseal joint and innervates the atlantoaxial and C2-3 zygapophyseal joints; therefore, trauma to or pathologic changes surrounding these joints can be a source of referred pain. The pain of C2 neuralgia is typically described as deep and dull located from the occipital to parietal, temporal, frontal, and periorbital regions. There is often an intermittent, lancinating pain in the occipital region superimposed over the constant pain. Associated signs can include ipsilateral eye lacrimation and conjunctival injection. Arterial or venous compression of the C2 spinal nerve or its dorsal root ganglion has been suggested as a cause for C2 neuralgia in some cases [12, 13, 14]. The third occipital nerve (dorsal ramus C3) has a close anatomic proximity to and
innervates the C2-3 zygapophyseal joint. This joint and thus the third occipital nerve appear most vulnerable to trauma from acceleration-deceleration injuries of the head and neck (commonly known as whiplash) [15*]. Pain from the C2-3 zygapophyseal joint can be referred to the occipital, frontotemporal, and periorbital regions. The characteristics of this referred head pain and its associated symptoms may mimic migraine or hemicrania continua but will not significantly respond to medications that are typically effective for these primary headache disorders. The resolution of chronic headache has been reported after diskectomy at spinal levels as low as C5-6 [16, 17**].

Diagnostic anesthetic blockade for the evaluation of cervicogenic headache can be directed to several anatomic structures such as the greater occipital nerve (dorsal ramus C2), lesser occipital nerve, atlanto-occipital joint, atlantoaxial joint, C2 or C3 spinal nerve, third occipital nerve (dorsal ramus C3), zygapophyseal joint(s), or intervertebral discs based on the clinical characteristics of the pain and the physical examination [18]. Fluoroscopic or interventional magnetic resonance imaging (MRI)-guided blockade is necessary to assure accurate and specific localization of the pain source [19, 20, 21].

Diagnostic imaging such as radiography, MRI, and CT myelography cannot confirm the presence of cervicogenic headache but can lend support to its diagnosis [22]. Imaging is used to search for secondary causes of pain that may require surgery or other more aggressive forms of treatment (ie, Arnold-Chiari malformation, herniated intervertebral disk, spinal or neural foraminal stenosis, vertebral or facet fracture, and intramedullary or extramedullary spinal tumors) [23]. Imaging procedures to examine the brain, cranio cervical junction, and cervical spine are often recommended. A laboratory evaluation may be necessary to search for systemic diseases that may adversely affect muscles, bones, or joints (ie, rheumatoid arthritis, systemic lupus erythematosus, thyroid or parathyroid disorders, and primary muscle disease).

Occipital neuralgia is a related condition that is characterized by pain occurring in the distribution of the greater or lesser occipital nerves [24]. The pain is typically experienced as a deep or burning pain with superimposed paroxysms of shooting or lancinating pain. Paresthesia and numbness over the occipital scalp are usually present. In the clinical assessment of this condition, it is difficult to determine the cause or source of pain. The pain may arise from trauma to or entrapment of the occipital nerve in the neck or scalp, but its source may also be from "deeper" anatomic structures or tissues such as the C2 spinal nerve, C1-2, or C2-3 zygapophyseal joints or pathology within the posterior cranial fossa. In clinical practice, it is not unusual to find that some cases given a diagnosis of "occipital neuralgia" are actually pain syndromes characterized by occipital pain referred from cervical structures or tissues other than the occipital nerve. Occipital nerve blockade as typically performed in the medical office setting can often result in a nonspecific regional blockade and "false localization" of the pain source to the occipital nerve, which may lead to unnecessary occipital neurolysis or other misdirected interventions [5**].

The occurrence of a regional myofascial pain syndrome involving cervical, pericranial, or masticatory muscles can cause head or face pain referred from the affected muscles. Sensory afferent nerve fibers from the upper cervical segments have been observed to enter the spinal column by way of the spinal accessory nerve before entering the dorsal spinal cord [25*, 26]. Motor fibers of the spinal accessory nerve can travel with the upper cervical spinal nerves, which carry both motor and sensory nerve fibers. The close proximity of these nerve fibers allows for an interchange of somatosensory, proprioceptive, and nociceptive information that ultimately converges in the trigeminocervical nucleus. This interchange and convergence of sensory information may allow the referral of nociceptive sensory signals from the trapezius, sternocleidomastoid, and other cervical muscles to regions of the head and face. Trigger points, discreet hyperirritable areas of contracted muscle that have a lowered pain threshold, are found in body regions affected by a myofascial pain syndrome [27]. An active trigger point is able to elicit spontaneous pain or pain after physical stimulation that is referred to distant sites in predictable and reproducible patterns [28]. A latent trigger point can also produce a referred pain pattern when it is manually compressed or when the involved muscle is stretched or stressed in some way. Trigger point injections can assist in the diagnostic evaluation of pain referred to the head or face from muscular sources [27].
Table 5: Potential treatment interventions for cervicogenic headache

Pharmacologic
- Tricyclic antidepressants: amitriptyline, nortriptyline, doxepin, and others
- Antiepileptic drugs: gabapentin, topiramate, carbamazepine, divalproex sodium
- Muscle relaxants: tizanidine, baclofen, cyclobenzaprine, metaxalone, and others
- Nonsteroidal anti-inflammatory drugs
  - Nonselective: ibuprofen, naproxen, indomethacin, and others
  - COX-2 selective: rofecoxib, celecoxib

Nonpharmacologic
- Manipulative therapies
- Physical therapy
- Transcutaneous electrical nerve stimulation
- Biofeedback/relaxation therapies
- Individual psychotherapy

Interventional
- Anesthetic blockades
  - Spinal roots, nerves, rami, or branches
- Zygapophyseal joints
- Trigger points
- Neurolytic procedures
  - Radiofrequency thermal neurolysis
  - Cryoneurolysis
- Botulinum toxin injections

Surgical
- Neurectomy
- Dorsal rhizotomy
- Microvascular decompression
- Nerve exploration and “release”
- Zygapophyseal joint fusion

Treatment

The successful treatment of cervicogenic headache requires a multifaceted approach using pharmacologic, nonpharmacologic, manipulative, anesthetic, and occasionally surgical interventions (Table 5). A majority of cervicogenic headaches after whiplash will resolve within a year of the trauma [29]. The multidisciplinary treatment team will employ a primary treating physician or pain specialist to manage medications, an anesthesiologist with experience in pain management, a psychologist, and a physical therapist or physician appropriately trained to provide manipulative treatments. Medications alone are often ineffective or provide only modest benefit. Many patients with cervicogenic headache overuse and become dependent on simple and opioid analgesics because they are often desperate to find pain relief. Successful nerve or zygapophyseal joint blockade will direct treatment toward proceeding with longer-acting neurolytic procedures such as radiofrequency thermal neurolysis [30] or occipital cryoneurolysis.

Pharmacologic treatment

Pharmacologic treatments for cervicogenic headache include some medications that are used for the preventive management for migraine and neuropathic pain (Table 6). The medications reviewed in this section have neither been approved by the Food and Drug Administration nor rigorously studied in controlled clinical trials for efficacy in the treatment of cervicogenic headache. The medications are
suggested as treatments for cervicogenic headache based on the anecdotal experiences of clinicians who treat the condition. The side effects and laboratory monitoring guidelines provided are not intended to be a comprehensive review and the reader is cautioned to consult standard references or the medication package inserts prior to prescribing any medication.

Medication when used as the sole treatment for cervicogenic headache does not tend to provide substantial pain relief in many cases but can often provide enough benefit to allow the patient to be more actively involved in a physical rehabilitation program. Medications are initially prescribed at a low dose and increased over 4 to 8 weeks as necessary and tolerated. The cautious combining of medications from different drug classes (rational polypharmacy) may provide more efficacy than using either drug alone (ie, an antiepileptic drug combined with a tricyclic antidepressant [TCA]). Frequent follow-up visits are necessary for medication dosage adjustments, monitoring of serum drug levels, and evidence of medication

The TCAs have long been used for the management of neuropathic, musculoskeletal, head, and face pain syndromes. Analgesic dosages are typically lower than those required for the treatment of depression. Nonetheless, serum drug levels may be used as a therapeutic guide. Liver transaminases and complete blood count should be monitored intermittently for evidence of toxicity. Sedation, confusion, weight gain, and anticholinergic side effects (xerostomia, blurred vision, constipation, urinary retention, orthostatic lightheadedness) may become problematic for some patients. Because the TCAs can cause cardiac conduction block at the atrioventricular node and intraventricular pathways, intermittent monitoring of the electrocardiogram is advisable while the TCA dosage is adjusted upward.

The antiepileptic drugs are modulators of pain transmission in the central nervous system and are used for the management of neuropathic, head, and face pain syndromes. Depakote (Abbott Pharmaceutical, Abbott Park, IL) (divalproex sodium) is indicated for the preventive management of migraine headache and may be effective for neurogenic and cervicogenic head pain. Serum drug levels can be used as a therapeutic guide. Monthly monitoring of liver transaminases and complete blood count for evidence of toxicity is recommended especially during the first 3 to 4 months of treatment or whenever dosages are increased. Potential side effects include nausea, sedation, disequilibrium, tremor, weight gain, and hair loss. Neurontin (Parke-Davis, Morris Plains, NJ) (gabapentin) has been used for the management of neuropathic and migraine pain. No specific laboratory monitoring is usually necessary. Side effects may include sedation, disequilibrium, agitation, peripheral edema, and elevated blood pressure. Topamax (Ortho-McNeil Pharmaceutical, Raritan, NJ) (topiramate) has demonstrated its effectiveness as a migraine preventive in early clinical studies. Electrolytes should be monitored intermittently because of this medication's ability to inhibit carbonic anhydrase. Side effects may include tingling of the face and extremities, sedation, appetite suppression, weight loss, and cognitive disturbances. Carbamazepine has been an effective medication in the treatment of neuropathic pain syndromes such as trigeminal neuralgia. Serum drug levels can be used as a therapeutic guide. Monthly monitoring of liver transaminases and complete blood count for evidence of toxicity is recommended especially during the first 3 to 4 months of treatment or whenever dosages are increased. Side effects may include nausea, disequilibrium, sedation, cognitive disturbances, and diplopia.

Muscle relaxants and nonsteroidal anti-inflammatory drugs (NSAIDs) may be used as scheduled medications for the preventive management of chronic pain or as necessary for the management of acute pain. The centrally acting muscle relaxants, Zanaflex (Athena Neurosciences, So. San Francisco, CA) (tizanidine) and baclofen, may be particularly efficacious for this condition. The COX-2 selective antagonists, Vioxx (Merck & Co. West Point, PA) (rofecoxib) and Celebrex (Pharmacia & Upjohn, Kalamazoo, MI) (celecoxib), appear to have less gastrointestinal toxicity than nonselective NSAIDs, but renal toxicity after long-term use remains as a concern. Migraine abortive medications such as ergots or triptans are not typically effective in providing relief from head pain. Narcotic analgesics are also not typically effective and are generally to be avoided. Botulinum toxin injections into pericranial and cervical muscles are a promising treatment for this condition [31, 32], but further clinical and scientific study is needed.
Physical therapy and manipulative treatment

When prescribed and expertly provided as an integral part of a multidisciplinary pain rehabilitation program, physical therapy and manipulative treatment are important therapeutic modalities [33]. The pain of cervicogenic headache tends to worsen after having manual or physical treatments that are performed too vigorously. A slow-paced progression of manipulation should begin with gentle muscle stretching and manual cervical traction thereafter advancing as tolerated. It is important to educate the patient in how to participate in a regularly scheduled home exercise and rehabilitation program. Anesthetic and neurolytic procedures can often provide enough pain relief to allow for a more comfortable and expedient course of manipulative treatment and physical rehabilitation.

Psychological and behavioral treatment

Psychological and nonpharmacologic interventions such as biofeedback, relaxation, and cognitive-behavioral therapy are important adjunctive treatments in a comprehensive pain management program [34]. Ongoing intensive, individual psychotherapy is often required if the patient with pain has a prominent affective or behavioral component and the head and neck pain persists despite aggressive treatment.

Anesthetic blockade and neurolysis

If the short-acting, diagnostic nerve or zygapophyseal joint blockade is successful in providing substantial pain relief, treatment will be directed toward proceeding with longer-acting neurolytic procedures such as radiofrequency thermal neurolysis [30, 35, 36] or occipital cryoneurolysis. Cervical epidural steroid injections may be indicated in cases of multilevel disc or spine degeneration [37]. Greater and lesser occipital nerve blockade may provide temporary but substantial pain relief in some cases [38]. Trigger point injections with a local anesthetic may also provide temporary pain relief and surrounding muscle relaxation. A course of physical therapy and rehabilitation is recommended after anesthetic blockade and neurolytic procedures to affect a longer-lasting benefit and restore function.

Surgical treatment

A variety of surgical interventions have been performed in the treatment of cervicogenic headache [3]. Surgical procedures such as neurectomy, dorsal rhizotomy, and microvascular decompression of nerve roots or peripheral nerves are not generally recommended unless compelling circumstances, such as radiologic evidence of a surgically correctable pathology or refractoriness to all reasonable nonsurgical treatments, warrant their consideration. Greater occipital nerve release, the surgical liberation of the occipital nerve from "entrapment" in the trapezius muscle and surrounding connective tissues, can provide substantial pain relief in a majority of cases but the return of pain within several months is common [39]. Temporary pain relief is also observed after greater occipital nerve transection (neurectomy) [39].
Conclusions

Cervicogenic headache is a cause of chronic headache that is often misdiagnosed or unrecognized. Its presenting symptom complex can be similar to that of the more commonly encountered primary headache disorders such as migraine or tension-type headache. Early diagnosis and management by way of a comprehensive, multidisciplinary pain treatment program can significantly decrease the protracted course of costly treatment and disability that is often associated with this challenging pain disorder.

References and Recommended Reading

Recently published papers of particular interest have been highlighted as:

* Of importance

** Of major importance


This important case report demonstrates that head pain referred from the neck can originate in spinal levels as low as C5-6, which is contrary to the long-held belief that it can only be generated from C1-3.


   Presents electron microscopic evidence supporting the presence of nociceptive sensory nerve fibers in the spinal accessory nerve. This finding is important because it provides a neuroanatomic basis for the referral of pain from the trapezius and sternocleidomastoid muscles to the head.


Cervical flexion, extension, protrusion, and retraction. A radiographic segmental analysis.


Ordway NR, Seymour RJ, Donelson RG, Hojnowski LS, Edwards WT.

Department of Orthopedic Surgery, SUNY Health Science Center at Syracuse, USA.
ordwayn@hscsyr.edu

STUDY DESIGN: A lateral radiographic analysis of the cervical spine was performed on 20 asymptomatic volunteers. OBJECTIVES: To quantify the contribution of each cervical segment to each of four sagittal cervical end-range positions: full-length flexion, full-length extension, protrusion, and retraction.

SUMMARY OF BACKGROUND DATA: Recent clinical research supports the relevance of cervical protrusion and retraction in symptomatic patients. Currently, few quantitative studies are available regarding cervical protrusion and retraction.

METHODS: Lateral cervical radiographs of 20 asymptomatic volunteers for four test positions and a neutral position were collected. Mean
angular measurements and available ranges of motion were calculated from the occiput to C7.

RESULTS: Retraction consists of lower cervical extension and upper cervical flexion, whereas protrusion consists of lower cervical flexion and upper cervical extension. Full-length cervical flexion produced more flexion at lower segments than did protrusion, and full-length cervical extension produced more extension at lower segments than did retraction. With both full-length flexion and retraction, upper cervical segments are positioned in the flexion portion of their total range, but only retraction takes Occ-C1 and C1-C2 to their full end-range of flexion. Similarly, with both full-length extension and protrusion, upper cervical segments are positioned in the extension portion of their total range, but only protrusion takes Occ-C1 and C1-C2 to their end-range of extension.

CONCLUSION: A greater range of motion at Occ-C1 and C1-C2 was found for the protruded and retracted positions compared with the full-length flexion and full-length extension positions. Effects on cervical symptoms reported to occur in response to flexion, extension, protrusion, and retraction test movements may correspond with the position of lower cervical segments.

PMID: 10025018 [PubMed - indexed for MEDLINE]

Magnetic resonance imaging of patients with cervicogenic headache.


Coskun O, Ucler S, Karakurum B, Atasoy HT, Yildirim T, Ozkan S, Inan LE.

Ministry of Health, Department of Neurology, Ankara Research Hospital, Ankara, Turkey. oecoskun@hotmail.com

Cervicogenic headache (CH) is a syndrome which is postulated to originate from nociceptive structures in the neck or head. The anatomical neck or head structures that are responsible for the pain in CH have not been clearly identified, but the pain in these patients probably originates from the structures of the cervical spine. In this study, cervical MRI were studied in 22 patients with cervicogenic headache and 20 control patients who did not have any disease which may effect the bone and muscle structures of cervical region. MRI imaging of cervical vertebra showed a disc bulging in 10 (45.4%) out of 22 patients with CH and in 9 (45.0%) of 20 controls (P > 0.05). The distribution of pathological lesions in patients and controls were not significantly different (P > 0.05). As a result, MRI may not be an adequate method to detect pathological findings underlying the aetiology of CH such as nerve roots, intervertebral joints and periosteum.
Cervicogenic headache: interventional, anesthetic, and ablative treatment.


Silverman SB.

Michigan Head Pain & Neurological Institute, 3120 Professional Drive, Ann Arbor, MI 48104, USA. LBriggs@mhni.com

Cervicogenic headache is becoming an accepted clinical syndrome in which headache pain is thought to originate from the cervical spine. Unfortunately, there are no diagnostic imaging techniques of the cervical spine and associated structures that can determine the exact source of pain. Therefore, diagnosis and treatment are based on the major accepted criteria of clinical presentation and the use of diagnostic nerve blocks to identify the source of the pain generator before considering further interventional or neuroablative treatment. This suggests that consistent reproducible anatomic and neurophysiologic pathways exist for the reproduction of typical clinical pain patterns and the ability of neuroblockade to consistently interrupt these pain pathways. This article
describes the essential anatomy required to understand the use of diagnostic nerve blocks, and their predictive value in anticipating response to neuroablative and interventional therapy with a review of the major interventional, anesthetic, and ablative techniques for cervicogenic headache.

Publication Types:

Cervicogenic headache: anatomic basis and pathophysiologic mechanisms.


Bogduk N.

Newcastle Bone and Joint Institute, University of Newcastle, Royal Newcastle Hospital, Newcastle, NSW 2300, Australia. mgillam@mail.newcastle.edu.au

Cervicogenic headache is pain perceived in the head but referred from a primary source in the cervical spine. The physiologic basis for this pain is convergence between trigeminal afferents and afferents from the upper three cervical spinal nerves. The possible sources of cervicogenic headache lie in the structures innervated by the C1 to C3 spinal nerves, and include the upper cervical synovial joints, the upper cervical muscles, the C2-3 disc, the vertebral and internal carotid arteries, and the dura mater of the upper spinal cord and posterior cranial fossa. Experiments in normal volunteers have established that the cervical muscles and joints can be sources of headache.

Publication Types:
Review
Cervicogenic headache: results of computer-based measurements of cervical spine mobility in 15 patients.


Pfaffenrath V, Dandekar R, Mayer ET, Hermann G, Pollmann W.

Ludwig-Maximilian University of Munich, Klinikum Grosshadern, Munich, FRG.

Head and neck pain are often attributed to impaired mobility of the cervical spine. No established methods exist to examine such an impaired mobility objectively in patients with cervicogenic headache. Therefore, functional roentgenograms of the cervical spine in maximum ventral and dorsal flexion were analyzed in 15 patients with cervicogenic headache and in 18 controls. Qualitative radiologic evaluation showed no significant differences in either group. A computer-based technique to assess the mobility of the cervical spine demonstrated a statistically pronounced hypomobility of the craniocervical joints C0/C2 and an impaired overall mobility of the upper cervical spine (C0-C5) in the cervicogenic headache group. The most evident hypomotility was found in segment C0/C1. Interesting was, furthermore, a
probably compensatory hypermotility in segment C6/C7. These findings did not correlate with the results of the qualitative radiologic evaluation.

PMID: 3359484 [PubMed - indexed for MEDLINE]
criteria have been established by several expert groups, with agreement that these headaches start in the neck or occipital region and are associated with tenderness of cervical paraspinal tissues. Prevalence estimates range from 0.4% to 2.5% of the general population to 15% to 20% of patients with chronic headaches. CGH affects patients with a mean age of 42.9 years, has a 4:1 female disposition, and tends to be chronic. Almost any pathology affecting the cervical spine has been implicated in the genesis of CGH as a result of convergence of sensory input from the cervical structures within the spinal nucleus of the trigeminal nerve. The main differential diagnoses are tension type headache and migraine headache, with considerable overlap in symptoms and findings between these conditions. No specific pathology has been noted on imaging or diagnostic studies which correlates with CGH. CGH seems unresponsive to common headache medication. Small, noncontrolled case series have reported moderate success with surgery and injections. A few randomized controlled trials and a number of case series support the use of cervical manipulation, transcutaneous electrical nerve stimulation, and botulinum toxin injection.

CONCLUSIONS: There remains considerable controversy and confusion on all matters pertaining to the topic of CGH. However, the amount of interest in the topic is growing, and it is anticipated that further research will help to clarify the theory, diagnosis, and treatment options for patients with CGH. Until then, it is essential that clinicians maintain an open, cautious, and critical approach to the literature on cervicogenic headaches.

Interobserver reliability in physical examination of the cervical spine in patients with headache.


Van Suijlekom HA, De Vet HC, Van Den Berg SG, Weber WE.

Pain Management and Research Center, Departments of Anesthesiology and Neurology, University Hospital of Maastricht, The Netherlands.

OBJECTIVE: To assess interobserver reliability of two expert headache neurologists when examining the cervical spine of patients with headache.

BACKGROUND: The diagnosis of cervicogenic headache involves the physical examination of the cervical spine. METHODS: Twenty-four patients diagnosed ashaving migraine, tension-type headache, or cervicogenic headache were included in the study. After interview, each patient's cervical spine was examined in a structured way. Reliability was assessed by Cohen's kappa.

RESULTS: Reduced range of motion in the cervical spine showed kappa scores indicating moderate agreement. Provocation of headache revealed moderate-to-substantial agreement. Assessment of zygapophyseal joint pressure pain showed slight-to-fair agreement. The kappa values of the circumscribed characteristic tender points showed agreement ranging from "not better than chance" to "substantial agreement."

CONCLUSIONS: Our study showed that the interobserver 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. However, standardization of the clinical tests in order to improve their reliability is recommended.

PMID: 10940097 [PubMed - indexed for MEDLINE]

Further clinical clarification of the muscle dysfunction in cervical headache.


Jull G, Barrett C, Magee R, Ho P.

Department of Physiotherapy, University of Queensland, Brisbane, Australia. jull@physio.therapies.uq.edu.au

The Headache Classification Committee of the International Headache Society listed impairments in cervical muscle function as criteria for headaches of cervical spine origin. Fifteen subjects with cervical headache and 15 controls were tested for the frequency of abnormal responses to passive stretching and abnormal muscle contraction. A new test of cranio-cervical flexion was used to assess the contraction of the deep neck flexors. Results indicated a trend towards a higher frequency of abnormal response to passive stretching of the muscles examined in the cervical headache group but only the upper trapezius proved significantly different to the control group. Deep neck flexor muscle contraction was significantly inferior in the cervical headache group. From the perspective of physical characterization of cervical headache, it appears that response from passive stretch of muscle may not be a strong criterion for cervical headache but deep neck flexor performance may have potential to identify musculoskeletal involvement in headache. The finding may also provide
positive directions for conservative treatment of cervical headache.

PMID: 10234466 [PubMed - indexed for MEDLINE]

Cervical headache: an investigation of natural head posture and upper cervical flexor muscle performance.


Watson DH, Trott PH.

School of Physiotherapy, University of South Australia.

In this study, 60 female subjects, aged between 25 and 40 years, were divided into two equal groups on the basis of absence or presence of headache. A passive accessory intervertebral mobility (PAIVM) examination was performed to confirm an upper cervical articular cause of the subjects' headache and a questionnaire was used to establish a profile of the headache population. Measurements of cranio-cervical posture and isometric strength and endurance of the upper cervical flexor muscles were compared between the two groups of subjects. The headache group was found to be significantly different from the non-headache group in respect to forward head posture (FHP) (t = -5.98, p < 0.00005), less isometric strength (t = 3.43, p < 0.001) and less endurance (t = 8.71, p < 0.0005) of the upper cervical flexors. A statistically significant relationship was also established between natural head posture and isometric endurance of the upper cervical flexor musculature which demonstrated that FHP corresponded with a low endurance capacity (chi 2 = 13.2; p < 0.01). The outcome of this
study highlights the need to screen for cervical etiology in patients who are suspected of suffering from common migraine.

Physical impairments in cervicogenic headache: traumatic vs. nontraumatic onset.

Cephalalgia. 2001 Nov;21(9):884-93.

Dumas JP, Arsenault AB, Boudreau G, Magnoux E, Lepage Y, Bellavance A, Loisel P.

School of Physical and Occupational Therapy, Faculty of Medicine, McGill University, Montreal, Canada.

In order to quantify the physical impairments associated with different types of headache, 77 subjects belonging to four different groups (postmotor vehicle accident cervicogenic headache subjects, cervicogenic headache subjects nontraumatic, migraine patients and control subjects) were evaluated using the following variables: posture, cervical range of motion, strength of the neck flexors and extensors, endurance of the short neck flexors, manual segmental mobility, proprioception of the neck, and pain (McGill Pain Questionnaire and the skin roll test). The results of this study showed that postmotor vehicle accident cervicogenic patients have significantly limited active cervical range of motion (in flexion/extension and rotations), present decreased strength and endurance of neck flexors and decreased strength of the extensor muscles. Our results suggest that there are enough differences between the postmotor vehicle accident and nontraumatic cervicogenic headache subjects to warrant caution when analysing the data of these two subgroups together, as several
studies have done in the past. The onset of headache is therefore an important variable that should be controlled for when attempting to characterize the physical impairments associated with cervicogenic headache.

The relationship between posture and curvature of the cervical spine.  

Visscher CM, de Boer W, Naeije M.

Department of Oral Function, Academic Centre for Dentistry, Amsterdam, The Netherlands.

OBJECTIVE: To study the relationship between posture and curvature of the cervical spine in healthy subjects. SUBJECTS: The study was composed of 54 healthy students (25 men and 29 women) aged 20-31 yr with a mean age of 24.7 yr. METHODS: Lateral radiographs were taken of the head and cervical spine of the subjects while standing in a neutral position. Cervical spine posture was quantified by the angle of a reference line, composed of reference points of the upper six cervical vertebrae, with the horizontal axis. The curvature of the cervical spine was classified visually as lordotic, straight or reversed. RESULTS: A relationship was found between posture and curvature of the cervical spine (p = .006); a more forward posture of the cervical spine was related to a partly reversed curvature; and a more upright posture was related to a lordotic curvature. Moreover, men more often exhibited a straight curvature, and women more often exhibited a partly reversed curvature.
CONCLUSION: The curvature of the cervical spine is related to the subject's posture and gender.

The correlation between surface measurement of head and neck posture and the anatomic position of the upper cervical vertebrae.


Johnson GM.

School of Physiotherapy, University of Otago, Dunedin, New Zealand.

STUDY DESIGN: Repeated measurements were made of surface postural angles registering the relative positions of the head and neck in photographs and of angles of the upper cervical vertebrae recorded in lateral cephalometric radiographs in the same subjects. For all registrations, subjects assumed the natural head rest position.

OBJECTIVES: To examine the correlation between external measurement of head and neck posture and the anatomic positions of the upper four cervical vertebrae.

SUMMARY OF BACKGROUND DATA: Interpretation of surface cervical posture measurement is confounded by lack of knowledge about the extent of the underlying compensatory adjustments among the upper cervical vertebrae that may accompany variation in head and neck posture. The correlation between surface measurement and postural characteristics of the upper cervical spine has not been reported to date.

METHODS: The association between a set of angles describing the anatomic position of the four upper cervical vertebrae on lateral cephalometric
radiographs and a surface measurement of head and neck posture, the craniovertebral angle, was studied in 34 young adult women aged between 17.2 and 30.5 years, mean age, 24.5 years. Anatomic positions of the upper four cervical vertebrae were expressed by angles relative to the true vertical or horizontal. Surface angles registering head and neck position for each subject were obtained from photographs recorded on two occasions.

RESULTS: No strong correlation could be established between the angles taken from the lateral cephalometric radiographs measuring the extent of upper cervical lordosis, orientation of the atlas, vertebral inclination, or odontoid process tilt and surface angles recording head and neck position. This finding was attributed principally to the much greater positional variability demonstrated within the upper cervical spine when compared with the surface measurements of head and neck position.

CONCLUSION: Anatomic alignment of the upper cervical vertebrae cannot be inferred from variation in surface measurement of head and neck posture. This is the case even in those people identified with more extreme head and neck postural tendencies.

Myoelectric manifestations of sternocleidomastoid and anterior scalene muscle fatigue in chronic neck pain patients.


Falla D, Rainoldi A, Merletti R, Jull G.

Department of Physiotherapy, The University of Queensland, Brisbane, Australia.

OBJECTIVE: This study compares myoelectric manifestations of fatigue of the sternocleidomastoid (SCM) and anterior scalene (AS) muscles between 10 chronic neck pain subjects and 10 normal matched controls.

METHODS: Surface electromyography (sEMG) signals were recorded from the sternal head of SCM and AS muscles bilaterally during sub-maximal isometric cervical flexion contractions at 25 and 50% of the maximum voluntary contraction (MVC). The mean frequency, average rectified value and conduction velocity of the sEMG signal were calculated to quantify myoelectric manifestations of muscle fatigue.

RESULTS: For both the SCM and AS muscles, the Mann-Whitney U test indicated that the initial value and slope of the mean frequency in neck pain
patients were greater than in healthy subjects (P < 0.05). This was significant both at 25 and 50% of MVC.

CONCLUSIONS: These results suggest: (a) a predominance of type-II fibres in the neck pain patients and/or (b) greater fatigability of the superficial cervical flexors in neck pain patients. These results are in agreement with previous muscle biopsy studies in subjects with neck pain, which identified transformation of slow-twitch type-I fibres to fast-twitch type-IIB fibres, as well as the clinical observation of reduced endurance in the cervical flexors in neck pain patients.

Neck flexor muscle strength, efficiency, and relaxation times in normal subjects and subjects with unilateral neck pain and headache.


Barton PM, Hayes KC.

Department of Clinical Neurosciences, University of Calgary, Alberta, Canada.

OBJECTIVE: To determine the test-retest reliability of a new method for measuring muscular strength, efficiency, and relaxation times of the neck flexor musculature of healthy adults, and to compare these neck flexor muscle properties in subjects who have unilateral neck pain and headache with those in controls.

DESIGN: Subjects lay supine and isometrically flexed their necks against a force transducer attached to the back of a webbing and velcro helmet. Electromyograms (EMGs) were recorded from surface electrodes on the sternocleidomastoid (SCM) muscles. Two consecutive sessions of five contractions of varying levels of effort from minimal through moderate and maximal effort were analyzed.

SETTING: Ambulatory referral center. PARTICIPANTS: Volunteer control subjects (n = 10, 3 men and 7 women) were recruited from hospital and
university personnel. Volunteer neck pain subjects (n = 10, 3 men and 7 women) were recruited from a physiatric chronic pain practice and a hospital outpatient physical therapy practice.

RESULTS: In the controls, the intraclass correlation coefficients (ICCs) for the first two maximum neck flexion contractions were; peak force ICC = .81; peak force/body weight ICC = .75; average force ICC = .75; force relaxation time ICC = .73; SCM EMG relaxation times: right ICC = .60 and left ICC = .67. Comparing sessions 1 and 2 the intraclass correlations for SCM efficiencies were right ICC = .58 and left ICC = .97. The peak force in controls (mean = 45.3 +/- 17.6N) was reduced by 50% in the neck pain subjects (mean = 22.4 +/- 13.1N) (p = .004). Similarly, peak force/body weight in the neck pain subjects (X = 0.3 +/- 0.2N/kg) was 46% of control (mean = 0.7 +/- 0.2N/kg) (p = .001), and average force in the neck pain subjects (X = 12.1 +/- 7.5N) was 43% of controls (mean = 28.5 +/- 11.0N) (p = .001). In two neck pain subjects. SCM, EMG and force relaxation times were abnormally long in both the affected and the unaffected SCM muscles, exceeding the control values by greater than 3 standard deviations. The difference between the right SCM efficiency of the control subjects (mean = 0.3 +/- 0.2N/ microV) and the affected SCM efficiency of the neck pain subjects (mean = 0.1 +/- 0.1 N/microV) approached the p < .05 criterion for significance (p = .055).

CONCLUSION: The technique was found to be highly reliable for the measurement of neck flexor peak force, peak force/body weight, average force, and force relaxation time, and moderately reliable for the quantitation of SCM EMG relaxation times and SCM efficiency. All force values were significantly lower in the neck pain population compared with the controls. In the neck pain population, force and SCM EMG relaxation times, as well as efficiencies, suggested abnormalities. Neck pain subjects showed no significant differences in SCM EMG relaxation time or SCM efficiency between affected and unaffected SCM muscles.

Occipital headaches stemming from the lateral atlanto-axial (C1-2) joint.


Aprill C, Axinn MJ, Bogduk N.

Magnolia Diagnostics, New Orleans, Louisiana, USA.

Studies in normal volunteers have demonstrated that the lateral atlanto-axial joints (C1-2) are capable of causing pain in the occiput, but few clinical studies have validated this source of occipital headache. The present study tested the null hypothesis that the lateral atlanto-axial joints are not a common source of occipital headache. Patients presenting with occipital pain underwent diagnostic blocks of their lateral atlanto-axial joints if they demonstrated clinical features presumptively suggestive of a C1-2 origin for their pain. Of 34 patients investigated, 21 obtained complete relief of their headache following diagnostic blocks, indicating that a C1-2 source of occipital pain is not rare. The clinical features used to select patients for blocks, however, had a positive predictive value of only 60%. Further study of headaches from C1-2 seems justified in order to establish more definitively the prevalence of this condition and how it might become better recognized in practice.
C2/C3 nerve blocks and greater occipital nerve block in cervicogenic headache treatment.

*Funct Neurol.* 2001 Jul-Sep;16(3):239-43.

Inan N, Ceyhan A, Inan L, Kavaklioglu O, Alptekin A, Unal N.

Ministry of Health, Department of Anaesthesiology, Ankara Training and Research Hospital, Turkey. nurteninan@yahoo.com

In the diagnosis of cervicogenic headache, greater occipital nerve (GON), cervical nerve, minor occipital nerve, and cervical facet joint blocks are used. In our study we compared the GON and C2/C3 nerve blocks in the diagnosis and treatment of cervicogenic headache. In both cases, repeated blocks proved to have a long-lasting effect in the treatment of this disorder, with both GON and C2/C3 blocks being found to be equally effective.
Functional radiographic examination of the cervical spine in patients with post-traumatic headache.


Jensen OK, Justesen T, Nielsen FF, Brixen K.

Department of Rheumatology, County Hospital, University of Aarhus, Denmark.

The segmental extension-flexion motion of the cervical spine and the overall C1-C7 motion were measured on functional X-rays in 19 patients with post-traumatic headache and 19 age- and sex-matched controls. The extension-flexion C1-C7 motion was reduced in patients with post-traumatic headache due to reduced motion in three segments: C2-C3, C5-C6 (p less than 0.05), and C6-C7 (p less than 0.01). In both groups a negative correlation between the C1-C7 motion and age was found, but the regression coefficients were different. Only in the control group could a negative correlation between segmental motion and age be demonstrated. In the patients with post-traumatic headache a statistically significant negative correlation between the log (pain index) and the age-corrected C1-C7 motion was found (p less than 0.04). On the segmental level a negative correlation between the log (pain index) and the age-corrected C1-C2 and C5-C6 motion could be demonstrated (p less than 0.05). Regarding C6-C7 there was a tendency to negative correlation. Furthermore, a negative correlation between the frequency of associated symptoms (dizziness, visual disturbances and ear symptoms) and the age-corrected C5-C6 motion was found. Consequently the decrement of motion primarily affected C2-C3, C5-C6, and C6-C7, whereas the analysis of correlation with pain index indicated C1-C2 and C5-C6 (C6-C7) as the most important segments involved.

Muscle hardness in patients with chronic tension-type headache: relation to actual headache state.


Ashina M, Bendtsen L, Jensen R, Sakai F, Olesen J.

Department of Neurology, Glostrup Hospital, University of Copenhagen, Denmark. ashina@dadlnet.dk

It has recently been reported that the pericranial muscles in patients with chronic tension-type headache are harder, i.e. have a higher consistency, than in controls. The primary aim of the present study was to investigate whether muscle hardness is influenced by the presence or absence of actual headache and whether hardness is correlated to tenderness. The secondary aim was to compare muscle hardness between patients and healthy controls. Hardness of the trapezius muscle was measured with a hardness meter in 20 patients with chronic tension-type headache and in 20 healthy controls. The patients were examined on 2 days, 1 day with headache and 1 day without headache. Pericranial myofascial tenderness was recorded with manual palpation. In addition, muscle hardness was measured in another five patients out-side headache and in 30 healthy controls.
The muscle hardness recorded in patients (n = 20) on days with headache, 98 +/- 26 kPa/cm, did not differ significantly from the muscle hardness recorded on days without headache, 100 +/- 21 kPa/cm, (P = 0.62). The muscle hardness was positively correlated to the local tenderness score recorded from the trapezius muscle both on days with headache (R = 0.52, P = 0.02) and on days without headache (R = 0.53, P = 0.02). The total tenderness score (TTS) recorded in patients on days with headache, 23 +/- 10, was significantly higher than the TTS recorded on days without headache, 15 +/- 11, (P = 0.0001). There was a significant difference between the TTS recorded in patients without headache, 15 +/- 11, and in controls, 4 +/- 4, (P = 0.002). The muscle hardness was significantly higher in patients on days without headache (n = 25), 97 +/- 20 kPa/cm, than in controls (n = 30), 87 +/- 16 kPa/cm (P = 0.03). On basis of previous and present results, we suggest that muscle hardness and muscle tenderness are permanently altered in chronic tension-type headache and not only a consequence of actual pain. In addition, the positive correlation between muscle hardness and tenderness supports the common clinical observation that tender muscles are harder than normal muscles.

Muscular factors are of importance in tension-type headache.


Jensen R, Bendtsen L, Olesen J.

Department of Neurology, Glostrup Hospital, University of Copenhagen, Denmark.

Recent studies have indicated that muscular disorders may be of importance for the development of increased pain sensitivity in patients with chronic tension-type headache. The objective of the present study was to investigate this hypothesis by examining the pain perception in tension-type headache with and without muscular disorders defined as increased tenderness. We examined 28 patients with episodic tension-type headache, 28 patients with chronic tension-type headache, and 30 healthy controls. Pericranial myofascial tenderness was recorded with manual palpation, and pressure pain detection and tolerances in cephalic and extracephalic locations with an electronic pressure algometer. In addition, thermal pain sensitivity and electromyographic activity were recorded. The main result was significantly lower pressure pain detection thresholds and tolerances in all the examined locations in patients with chronic
tension-type headache with a muscular disorder compared to those without a muscular disorder. There were no such differences in any of the examined locations when the two subgroups of patients with episodic tension-type headache were compared. Thermal pain sensitivity did not differ between patients with and without a muscular disorder, while electromyographic activity levels were significantly higher in patients with chronic tension-type headache with than in those without a muscular disorder. Our results strongly indicate that prolonged nociceptive stimuli from the pericranial myofascial tissue sensitize the central nervous system and, thereby, lead to an increased general pain sensitivity. Muscular factors may, therefore, be of major importance for the conversion of episodic into chronic tension-type headache. The present study complements the understanding of the important interactions between peripheral and central factors in tension-type headache and may lead to a better prevention and treatment of the most prevalent type of headache.

Inventarisatie van effectonderzoek naar regelmatig toegepaste fysiotherapeutische behandelingen bij chronisch benigne pijn

**Titel:** Inventarisatie van effectonderzoek naar regelmatig toegepaste fysiotherapeutische behandelingen bij chronisch benigne pijn

**Auteur(s):** Kroese, M.E.A.L., ; Vet, H.C.W., de; Scholten, R.J.P.M., ;

**Bron:** Ned Tijdschr Fysiotherapie - Jrg. 112, nr. 2 (2002) ; p. 42-49

**Trefwoorden:** effectonderzoek, review, fysiotherapie, chronische pijn. hoofdpijn, lage rugklachten, nekklachten, schouderklachten, fibromyalgie.

**Classificatie:** F1031

**Onderwerp:** pijn.

**Taal:** Nederlands

**Formaat:** tijdschriftartikel; systematische review

**Samenvatting:** Deze inventarisatie betreft de bestaande onderzoeken naar de effectiviteit van regelmatig in Nederland toegepaste behandelingen bij een aantal chronisch benigne pijnssyndromen (spanningshoofdpijn, lage-
rug-, nek- en schouderpijn en primair fibromyalgie syndroom). Het doel van de inventarisatie is enerzijds na te gaan wat er bekend is over de effectiviteit van deze behandelingen en anderzijds uit te zoeken voor welke onderwerpen een systematische review (SR) gewenst is en voor welke nieuw effectonderzoek noodzakelijk. Dit artikel beschrijft de bevindingen voor de fysiotherapeutische en de daaraan gerelateerde behandelingen. In de bibliografische computerbestanden Medline, EMBASE, Psyclit, en The Cochrane Library en d.m.v. het checken van referenties, is gezocht naar recente SR’s. Als geen SR’s werden gevonden, is gezocht naar randomised clinical trials (RCT’s). De methodologische kwaliteit van de gevonden SR’s werd beoordeeld. Van de RCT’s werden alleen de abstracts bestudeerd. Per syndroom en per interventie is het aantal SR’s en hun kwaliteit weergegeven, het aantal uitgevoerde RCT’s, gevolgd door een statement in hoeverre de werkzaamheid is aangetoond en een aanbeveling voor (nieuwe) SR’s dan wel nieuwe RCT’s. Voor spanningshoofdpijn lijken ontspanningsoefeningen effectief op basis van de gevonden RCT’s, maar een SR naar het effect hiervan is nog wenselijk, evenals een SR naar het effect van cognitieve behandeling. Voor actieve en passieve bewegingstherapie en klassieke massage bij spanningshoofdpijn worden RCT’s aanbevolen. Wat betreft lage-rugpijn is in recente SR’s de meerwaarde van oefentherapie (t.o.v. huisartszorg). De meerwaarde van oefentherapie in vergelijking met andere vormen van fysiotherapie is nog onduidelijk. Nieuwe RCT’s zijn wenselijk voor massage, oefentherapie Mensendieck en zwemmen. Bij nekpijn worden nieuwe RCT’s aanbevolen: naar het effect van fysiotherapie gezien de inconsistentte resultaten van de reviews, voor cognitief-gedragsmatige therapie omdat er nog weening effectonderzoek gedaan is. Voor schouderpijn laten goede SR’s naar het effect van fysiotherapie nog geen conclusies t.a.v. effectiviteit toe, zodat een nieuwe RCT noodzakelijk is. RCT’s worden verder aanbevolen voor cognitief-gedragsmatige therapie, rust/het vermijden van provocerende factoren en massage. Voor het primair fibromyalgie syndroom (PFS) is het effect van cognitief-gedragsmatige therapie en fysiotherapie nog weening onderzocht. Nieuwe RCT’s naar de werkzaamheid van deze behandelingen zijn daarom wenselijk. Voor fitness/aerobics is een SR aan te bevelen vanwege de inconsistentte uitkomsten van de RCT’s. De effectiviteit van de meeste regelmatig toegepaste fysiotherapeutische behandelingen bij spanningshoofdpijn, lage-rug-, nek- en schouderpijn en fibromyalgie is nog onvoldoende aangetoond door goed wetenschappelijk onderzoek. Positieve uitzonderingen zijn de cognitief-gedragsmatige behandeling en oefentherapie voor chronische lage-rugpijn. Wat betreft de behoefte aan nieuw onderzoek: voor sommige behandelingen bestaat er behoefte aan SR’s, maar voor de meeste behandelingen zijn nieuwe RCT’s gewenst.
The effectiveness of spinal manipulation for the treatment of headache disorders: a systematic review of randomized clinical trials.


Astin JA, Ernst E.

California Pacific Medical Center Research Institute, USA.
john@integrativearts.com.

To carry out a systematic review of the literature examining the effectiveness of spinal manipulation for the treatment of headache disorders, computerized literature searches were carried out in Medline, Embase, Amed and CISCOM. Studies were included only if they were randomized trials of (any type of) spinal manipulation for (any type of) headache in human patients in which spinal manipulation was compared either to no
treatment, usual medical care, a 'sham' intervention, or to some other active treatment. Two investigators independently extracted data on study design, sample size and characteristics, type of intervention, type of control/comparison, direction and nature of the outcome(s). Methodological quality of the trials was also assessed using the Jadad scale. Eight trials were identified that met our inclusion criteria. Three examined tension-type headaches, three migraine, one 'cervicogenic' headache, and one 'spondylogenic' chronic headache. In two studies, patients receiving spinal manipulation showed comparable improvements in migraine and tension headaches compared to drug treatment. In the 4 studies employing some 'sham' interventions (e.g. laser light therapy), results were less conclusive with 2 studies showing a benefit for manipulation and 2 studies failing to find such an effect. Considerable methodological limitations were observed in most trials, the principal one being inadequate control for nonspecific (placebo) effects.

Despite claims that spinal manipulation is an effective treatment for headache, the data available to date do not support such definitive conclusions. It is unclear to what extent the observed treatment effects can be explained by manipulation or by nonspecific factors (e.g. of personal attention, patient expectation). Whether manipulation produces any long-term changes in these conditions is also uncertain. Future studies should address these two crucial questions and overcome the methodological limitations of previous trials.


Title: Manual therapy for mechanical neck disorders: a systematic review

Source: 

Method: systematic review

Method Score: This is a systematic review. Systematic reviews are not rated.

Abstract: Neck disorders are common, disabling and costly. Randomized trials were reviewed using a Cochrane format, to determine if manual therapy improves pain, function and patient satisfaction in adults suffering from neck disorders with and without radicular findings or headache. Sequenced computerized searches ended in December 1997. Two independent reviewers extracted data while three assessed trial quality. Standard mean difference and relative risks were translated to number needed to treat (NNT) and the percent treatment advantage. The 20 selected trials’ quality was 2.4 (SD: 1.04) on the 5-point scale described by Jadad. Trials were clinically heterogenous. Manipulation alone, mobilizations alone, manipulation/mobilization and treatments including massage consistently showed similar effects to placebo, wait period or control. Multimodal manual therapy care including exercise were superior to a control, to certain physical medicine methods and to rest for pain and patient satisfaction. The NNT for a clinically important reduction in pain varied from 2 to 11 and treatment advantage from 6% to 41% at the cost of benign transient side-effects. While results remain inconclusive, some clinical themes have emerged. For mechanical neck disorder with or without headache, it appears that to be most beneficial, manual therapies should be done with exercise for improving pain and patient satisfaction. Manipulation and mobilization alone appear to be less effective. Factorial design would help delineate the magnitude of effect for each component of care.

Author: Mior S
Manipulation and mobilization in the treatment of chronic pain

Source:

Method: systematic review

Method Score: This is a systematic review. Systematic reviews are not rated.

Abstract: Objective: The purpose of this review was to determine how effective manipulation and mobilization are in the treatment of chronic pain. Reviews addressing the effectiveness of manipulation and mobilization for low back pain, two systematic reviews addressing chronic neck pain, three randomized controlled trials addressing post-traumatic headache and neck pain, and one systematic review and one randomized controlled trial addressing upper limb (including shoulder) disorders, which were often combined with other interventions, and this could have enhanced or masked effectiveness. Subject groups were heterogeneous, and investigators did not indicate effectiveness for subgroups. Systematic reviews of chronic low back pain found evidence of effectiveness compared with placebo and with usual care. Evidence from the systematic reviews for chronic neck pain and from the systematic review and randomized controlled trial for chronic soft tissue shoulder disorders was contradictory. For posttraumatic headache, the randomized controlled trials reported a time-limited positive benefit or no different effects than comparison treatment. Chronic low back pain than placebos or usual care for up to 6 months (level 2). For chronic post-traumatic headache, evidence of effectiveness of manipulation and mobilization is limited (level 3). Manipulation and mobilization may or may not be effective for either chronic neck pain or chronic soft tissue shoulder disorders (level 4b).
Author/Association: Hurwitz EL, Aker PD, Adams AH, Meeker WC, Shekelle PG, Barr JS Jr

Title: Manipulation and mobilization of the cervical spine: A systematic review of the literature.

Source: Spine Vol 21(15) (pp 1746-1760), 1996.

Method: systematic review

Method Score: This is a systematic review. Systematic reviews are not rated.

Abstract: Study Design. Cervical spine manipulation and mobilization were reviewed in an analysis of the literature from 1966 to the present. To assess the evidence for the efficacy and complications of cervical spine manipulation and mobilization for the treatment of neck pain and headache. Summary of Background Data. Although recent research has demonstrated the efficacy of spinal manipulation for some patients with low back pain, little is known about its efficacy for neck pain and headache. Methods. A structured search of four computerized bibliographic data bases was performed to identify articles on the efficacy and complications of cervical spine manual therapy. Data were summarized, and randomized controlled trials were critically appraised for study quality. The confidence profile method of meta-analysis was used to estimate the effect of spinal manipulation on patients' pain status. Results. Two of three randomized controlled trials showed a short-term benefit for cervical mobilization for acute neck pain. The combination of three of the randomized controlled trials comparing spinal manipulation with other therapies for patients with subacute or chronic neck pain showed an improvement on a 100-mm visual analogue scale of pain at 3 weeks of 12.6 mm (95% confidence interval, −0.15, 25.5) for manipulation compared with muscle relaxants or usual medical care. The highest quality randomized controlled trial demonstrated that spinal manipulation provided short-term relief for patients with tension-type headache. The complication rate for cervical spine manipulation is estimated to be between 5 and 10 per 10 million manipulations. Conclusions. Cervical spine manipulation and mobilization probably provide at least short-term benefits for some patients with neck pain and headaches. Although the complication rate of manipulation is small, the potential for adverse outcomes must be considered because of the possibility of permanent impairment or death.

Author/Association: Bogaards MC, ter Kuile MM

Title: Treatment of recurrent tension headache: a meta-analytic review.


Method: systematic review

Method Score: This is a systematic review. Systematic reviews are not rated.

Abstract: The primary aim of this study was to investigate which treatment, patient,
and study characteristics are related to treatment outcome in tension headache. Literature on the subject was obtained by searching for articles published in English through CD-rom Compact Cambridge and PSYCHLIT (1970/1993) on the subjects of headache and tension or muscle contraction in combination with therapy or treatment. Inclusion criteria were prospective design, tension headache, > or = five subjects per condition; pre- and posttreatment scores available, subjects older than 16 years. Each article was independently reviewed and its data encoded by the two authors. Finally, 78 articles with 175 treated and nontreated conditions (total of 2,866 patients) were selected for this study. Meta-analysis revealed that cognitive therapy, relaxation, or electromyelographic (EMG) biofeedback alone or in combination with relaxation were superior to no treatment and to pseudo/placebo therapy. Pharmacological and other therapies were better than no treatment. However, restricting the analyses to studies using a headache diary, the results of pharmacological therapy were comparable to those of placebo therapy. Moreover, a better treatment outcome was found in studies with a relatively short duration of headache complaints ($r = -0.31$) and with a relatively younger patient sample ($r = -0.22$). The year of publication was negatively related with improvement ($r = -0.36$). No relationship between treatment outcome and other treatment characteristics (duration, transfer of treatment), patient characteristics (gender, method of patient recruitment), and study characteristics (internal validity of the study, criteria for diagnosing tension headache, number of patients, drop-outs) was found. These findings suggest that treatment outcome may be affected more by patient characteristics than by treatment characteristics. Finally, some practical and research implications of these findings are discussed.

The effect of initial head position on active cervical axial rotation range of motion in two age populations.


Walmsley RP, Kimber P, Culham E.

School of Rehabilitation Therapy, Queen's University, Kingston, Ontario, Canada.

STUDY DESIGN: This study analyzed cervical axial rotation initiated from five different starting positions in asymptomatic subjects. The results were analyzed to ascertain if rationale for certain clinical assessment methods could be justified.

SUMMARY OF BACKGROUND DATA: In the assessment of the cervical spine, many clinicians use assessment techniques that propose to isolate anatomic
structures by using various permutations and combinations of the three gross rotational movements, for example, evaluation of axial rotation in flexion and extension.

OBJECTIVES: The primary purpose of this study was to compare the magnitude of cervical axial rotation when started from neutral, flexion, extension, protraction, and retraction, and the protraction-retraction range of motion also was determined.

METHODS: Two groups of 30 subjects, one group aged 18-30 years and the other group aged 50-65 years and stratified by gender, participated in the study. The 3Space Tracker system (Polhemus, A Kaiser Aero-space and Electronics, Co., Colchester, VT), an electromagnetic tracking device, was used to determine the angular and linear position of the head relative to the sternum by detecting the position and orientation of two sensors attached to the forehead and sternum.

RESULTS: Analysis of variance of the data revealed a statistically significant difference (p < 0.05) in axial rotation between all of the five starting positions. The younger age group demonstrated greater range of motion when rotation was initiated from neutral and extension, whereas the older group had greater range when the motion was initiated from protraction, retraction, and flexion.

CONCLUSIONS: The results suggest that varying the starting sagittal head position may affect the anatomic structures involved in restraining axial rotation. This supports the clinical approach to range of motion assessment in combined movement patterns.

Measuring range of active cervical rotation in a position of full head flexion using the 3D Fastrak measurement system: an intra-tester reliability study.


Amiri M, Jull G, Bullock-Saxton J.

Department of Physiotherapy, The University of Queensland, Brisbane, Australia. m.amiri@shrs.uq.edu.au

Most external assessments of cervical range of motion assess the upper and lower cervical regions simultaneously. This study investigated the within and between days reliability of the clinical method used to bias this
movement to the upper cervical region, namely measuring rotation of the head and neck in a position of full cervical flexion. Measurements were made using the Fastrak measurement system and were conducted by one operator. Results indicated high levels of within and between days repeatability (range of ICC2,1 values: 0.85–0.95). The ranges of axial rotation to right and left, measured with the neck positioned in full flexion, were approximately 56% and 50%, respectively of total cervical rotation, which relates well to the proportional division of rotation in the upper and lower cervical regions. These results suggest that this method of measuring rotation would be appropriate for use in subject studies where movement dysfunction is present in the upper cervical region, such as those with cervicogenic headache.

The effect of spinal manipulation in the treatment of cervicogenic headache.


Nilsson N, Christensen HW, Hartvigsen J.

Institute of Medical Biology (Biomechanics), Faculty of Health Science, University of Odense, Denmark.

PURPOSE: To study whether the isolated intervention of high-speed, low-amplitude spinal manipulation in the cervical spine has any effect on cervicogenic headache.
DESIGN: Prospective randomized controlled trial with a blinded
observer. SETTING: Ambulatory outpatient facility in an independent research institution. PARTICIPANTS: Fifty-three subjects suffering from frequent headaches who fulfilled the International Headache Society criteria for cervicogenic headache (excluding radiological criteria). These subjects were recruited from 450 headache sufferers who responded to newspaper advertisements.

INTERVENTION: After randomization, 28 of the group received high-velocity, low-amplitude cervical manipulation twice a week for 3 wk. The remaining 25 received low-level laser in the upper cervical region and deep friction massage (including trigger points) in the lower cervical/upper thoracic region, also twice a week for 3 wk.

MAIN OUTCOME MEASURES: The change from week 1 to week 5 in analgesic use per day, in headache intensity per episode and in number of headache hours per day, as registered in a headache diary.

RESULTS: The use of analgesics decreased by 36% in the manipulation group, but was unchanged in the soft-tissue group; this difference was statistically significant (p = .04, chi 2 for trend). The number of headache hours per day decreased by 69% in the manipulation group, compared with 37% in the soft-tissue group; this was significant at p = .03 (Mann-Whitney). Finally, headache intensity per episode decreased by 36% in the manipulation group, compared with 17% in the soft-tissue group; this was significant at p = .04 (Mann-Whitney).

CONCLUSION: Spinal manipulation has a significant positive effect in cases of cervicogenic headache.

A proposed etiology of cervicogenic headache: the neurophysiologic basis and anatomic relationship between the dura mater and the rectus posterior capitis minor muscle.


Alix ME, Bates DK.

Logan College of Chiropractic, Chesterfield, Missouri, USA.
dralix@worldnet.att.net

OBJECTIVE: To examine the neurophysiologic basis and anatomic relationship between the dura mater and the rectus capitis posterior minor muscle in the
etiologic proposition of cervicogenic headache. DATA SOURCES: On-line searches in MEDLINE and the Index to Chiropractic Literature, manual citation searches, and peer inquiries.

RESULTS: Connective tissue bridges were noted at the atlanto-occipital junction between the rectus capitis posterior minor muscle and the dorsal spinal dura. The perpendicular arrangement of these fibers appears to restrict dural movement toward the spinal cord. The ligamentum nuchae was found to be continuous with the posterior cervical spinal dura and the lateral portion of the occipital bone. Anatomic structures innervated by cervical nerves C1-C3 have the potential to cause headache pain. Included are the joint complexes of the upper 3 cervical segments, the dura mater, and spinal cord.

CONCLUSION: A sizable body of clinical studies note the effect of manipulation on headache. These results support its effectiveness. The dura-muscular, dura-ligamentous connections in the upper cervical spine and occipital areas may provide anatomic and physiologic answers to the cause of the cervicogenic headache. This proposal would further explain manipulation's efficacy in the treatment of cervicogenic headache. Further studies in this area are warranted to better define the mechanisms of this anatomic relationship.

The prevalence of cervicogenic headache in a random population sample of 20-59 year olds.


Nilsson N.

Department of Clinical Science, Faculty of Health Science, University of Odense, Denmark.
STUDY DESIGN. From a random population sample, those experiencing frequent headaches were identified. They were examined to determine how many fulfilled the 1990 International Headache Society classification criteria for cervicogenic headache. OBJECTIVE. To estimate the prevalence of cervicogenic headache in the general population and in the group experiencing frequent headaches. SUMMARY OF BACKGROUND DATA. Only with the publication of the 1990 headache classification criteria did a generally accepted clinical definition of cervicogenic headache emerge. The prevalence of this form of headache has been estimated only in two highly selected in-clinic patient populations. No data exist regarding the prevalence in representative unselected populations. METHODS. A short questionnaire on headaches was mailed to 826 randomly selected residents of a midsized Danish town. A group of 57 individuals in the age range 20–59 years who reported having headache episodes on 5 or more days in the previous month were identified. Forty-five of the 57 were eventually interviewed and examined with respect to the IHS criteria for cervicogenic headache (the radiological criteria were omitted on ethical grounds). RESULTS. Of the 45 persons examined, eight fulfilled the diagnostic criteria for cervicogenic headache, equivalent to a prevalence in the headache group of 17.8% (95% confidence interval = 8%–32%). CONCLUSIONS. Cervicogenic headache appears to be a relatively common form of headache, similar to migraine in prevalence.

Neck mobility in different headache disorders.


Zwart JA.

Department of Neurology, Regionsykehuset i Trondheim, Norway.

The main purpose of this study was to assess neck mobility (by Cybex equipment) in different headache disorders and, in particular, cervicogenic headache, and to compare these findings with those in controls. A total of 51 control subjects and 90 headache patients were investigated, where of 28 patients suffered from common migraine (migraine without aura), 34 from
tension-type headache (9 episodic and 25 chronic), and 28 patients from cervicogenic headache. One-way ANOVA and post hoc Bonferroni analysis showed significant differences between those with cervicogenic headache and the other groups for rotation (P < 0.001) and flexion/extension (P < 0.001), but not for lateral neck movement (P = NS). There were no significant differences between migraine patients, tension-type headache patients and controls. In all four groups, there was a significant positive correlation between active and passive neck movement for rotation (P <0.001), flexion/extension (P < 0.001), and lateral neck movement (P < 0.001). Repeated measures analysis of variance (ANOVA) showed no significant day-to-day differences in 10 control subjects. In the control group (n = 51), there was a significant negative correlation between age and neck movement. For rotation, Pearson's correlation coefficient was; r = -0.71 (P < 0.001), for flexion/extension r = -0.71 (P < 0.001), and for lateral neck movement r = -0.67 (P < 0.001). No significant sex difference was found as for any of the neck movements. Pain at the time of investigation did not seem to influence neck mobility. Cervicogenic headache has been recognized as a pain syndrome by the International Association for the Study of Pain (IASP). Since reduced neck mobility is one of the major criteria for this diagnosis, it emphasizes the need for systematic, objective neck mobility measurements in the individual patient to substantiate the diagnosis. The technique is simple and proved reliable.

Psychosocial correlates and impact of chronic tension-type headaches.


Holroyd KA, Stensland M, Lipchik GL, Hill KR, O'Donnell FS, Cordingley G.

Psychology Department, Ohio University, Athens 45701, USA.

OBJECTIVES: To examine the psychosocial correlates of chronic tension-type headache and the impact of chronic tension-type headache on work, social functioning, and well-being. METHODS: Two hundred forty-five patients (mean age = 37.0 years) with chronic tension-type headache as a primary presenting problem completed an assessment protocol as part of a larger treatment outcome study.
The assessment included a structured diagnostic interview, the Medical Outcomes Study Short Form, Disability Days/Impairment Ratings, Recurrent Illness Impact Profile, Beck Depression Inventory, State-Trait Anxiety Inventory-Trait Form, Primary Care Evaluation for Mental Disorders, and the Hassles Scale Short Form.

Comparisons were made with matched controls (N = 89) and, secondarily, with Medical Outcomes Study data for the general population, arthritis, and back problem samples. RESULTS: About two thirds of those with chronic tension-type headache recorded daily or near daily (> or =25 days per month) headaches with few (12%) recording headaches on less than 20 days per month. Despite the fact that patients reported that their headaches had occurred at approximately the present frequency for an average of 7 years, chronic tension-type headache sufferers were largely lapsed consulters (54% of subjects) or current consulters in primary care (81% of consulters). Significant impairments in functioning and well-being were evident in chronic tension-type headache and were captured by each of the assessment devices. Although headache-related disability days were reported by 74% of patients (mean = 7 days in previous 6 months), work or social functioning was severely impaired in only a small minority of patients. Sleep, energy level, and emotional well-being were frequently impaired with about one third of patients recording impairments in these areas on 10 or more days per month. Most patients with chronic tension-type headache continued to carry out daily life responsibilities when in pain, although role performance at times was clearly impaired by headaches and well-being was frequently impaired. Chronic tension-type headache sufferers were 3 to 15 times more likely than matched controls to receive a diagnosis of an anxiety or mood disorder with almost half of the patients exhibiting clinically significant levels of anxiety or depression. Affective distress and severity of headaches (Headache Index) were important determinants of headache impact/impairment.

CONCLUSIONS: Chronic tension-type headache has a greater impact on individuals' lives than has generally been realized, with affective distress being an important correlate of impairment. If treatment is to remedy impairment in functioning, affective distress, as well as pain, thus needs to be addressed.

Cervicogenic headaches: a critical review.


Haldeman S, Dagenais S.

Department of Neurology, University of California, Irvine, Medical Center, 101 The City Drive South, Orange, CA 92868, USA. HaldemanMD@aol.com

BACKGROUND CONTEXT: The notion that headaches may originate from disorders of the cervical spine and can be relieved by treatments directed at the neck is gaining recognition among headache clinicians but is often neglected in the spine literature. PURPOSE: To review and summarize the
literature on cervicogenic headaches in the following areas: historical perspective, diagnostic criteria, epidemiology, pathogenesis, differential diagnosis, and treatment. STUDY DESIGN/SETTING: A systematic literature review of cervicogenic headache was performed. METHODS: Three computerized medical databases (Medline, Cumulative Index to Nursing and Allied Health Literature [CINAHL], Mantis) were searched for the terms "cervicogenic" and "headache." After cross-referencing, we retrieved 164 unique citations; 48 citations were added from other sources, for a total of 212 citations, although all were not used. RESULTS: Hilton described the concept of headaches originating from the cervical spine in 1860. In 1983 Sjaastad introduced the term "cervicogenic headache" (CGH). Diagnostic criteria have been established by several expert groups, with agreement that these headaches start in the neck or occipital region and are associated with tenderness of cervical paraspinal tissues. Prevalence estimates range from 0.4% to 2.5% of the general population to 15% to 20% of patients with chronic headaches. CGH affects patients with a mean age of 42.9 years, has a 4:1 female disposition, and tends to be chronic. Almost any pathology affecting the cervical spine has been implicated in the genesis of CGH as a result of convergence of sensory input from the cervical structures within the spinal nucleus of the trigeminal nerve. The main differential diagnoses are tension type headache and migraine headache, with considerable overlap in symptoms and findings between these conditions. No specific pathology has been noted on imaging or diagnostic studies which correlates with CGH. CGH seems unresponsive to common headache medication. Small, noncontrolled case series have reported moderate success with surgery and injections. A few randomized controlled trials and a number of case series support the use of cervical manipulation, transcutaneous electrical nerve stimulation, and botulinum toxin injection.

CONCLUSIONS: There remains considerable controversy and confusion on all matters pertaining to the topic of CGH. However, the amount of interest in the topic is growing, and it is anticipated that further research will help to clarify the theory, diagnosis, and treatment options for patients with CGH. Until then, it is essential that clinicians maintain an open, cautious, and critical approach to the literature on cervicogenic headaches.


Epidemiology and socio-economic impact of headache.

Rasmussen BK.

Department of Neurology, Glostrup Hospital, University of Copenhagen, Denmark.
birthe.k.rasmussen@dahlnet.dk

Headache disorders constitute a public-health problem of enormous proportions, with an impact on both the individual sufferer and society. Epidemiological knowledge is required to quantitate the significance of these disorders. The effects on individuals can be assessed by examining
prevalence, distribution, attack frequency and duration, and headache-related disability. The socio-economic burden includes both direct costs associated with healthcare utilization and costs associated with missed work due to sickness absence or reduced efficiency. The individual and socio-economic burden of headaches is substantial. Headache disorders deserve more attention, especially concerning strategies leading to adequate primary prevention, diagnosis, and treatment.


Diagnosis, epidemiology, and impact of tension-type headache.

Jensen R.

Danish Headache Center, Department of Neurology, University of Copenhagen, DK-2600 Glostrup, Denmark. rigj@glostruphos.kbhambt.dk

Although tension-type headache is the most prevalent headache and affects 78% of the general population, the substantial societal and individual burden associated with this primary headache has been overlooked. In contrast to migraine headache, there has been limited focus on tension-type headache. Most patients with the chronic form of tension-type headache, which affects 3% of the population, are left virtually without any specific treatment. Chronic tension-type headache differs from the episodic form in frequency, lack of effect to most treatment strategies, more medication overuse, and more loss of quality of life. Daily or near daily headaches also constitute a major diagnostic and therapeutic problem and distinguishing chronic tension-type headache from migraine headache and from medication-induced headache is a substantial diagnostic challenge because management strategies are completely different. Considerable benefits for the society can be gained by specific strategies leading to reductions in the amount of sickness absence and impaired working abilities. The burden on the affected patients' and their families' quality of life also may be improved by a general acceptance of the disorder and by the development of a specific treatment strategy.

Acupuncture for idiopathic headache (Cochrane Review)


ABSTRACT

A substantive amendment to this systematic review was last made on 27 November 2000. Cochrane reviews are regularly checked and updated if necessary.

Background: Acupuncture is widely used for the treatment of headache, but its effectiveness is controversial.
**Objectives:** To determine whether acupuncture is:
more effective than no treatment
more effective than 'sham' (placebo) acupuncture
as effective as other interventions used to treat idiopathic (primary) headaches.

**Search strategy:** Electronic searches were performed in MEDLINE, EMBASE, the Cochrane Controlled Trials Register, and the database of the Cochrane Field for Complementary Medicine. We also contacted researchers in the field and checked the bibliographies of all articles obtained.

**Selection criteria:** Randomized or quasi-randomized clinical trials comparing acupuncture with any type of control intervention for the treatment of idiopathic (primary) headaches were included.

**Data collection and analysis:** Information on patients, interventions, methods, and results was extracted by at least two independent reviewers using a pre-tested standard form. Results on headache frequency and intensity were summarized descriptively. Responder rate ratios (responder rate in treatment group/responder rate in control group) were calculated as a crude indicator of results for sham-acupuncture-controlled trials. Quantitative meta-analysis was not possible due to trial heterogeneity and insufficient reporting.

**Main results:** Twenty-six trials including a total of 1151 patients (median, 37; range, 10-150) met the inclusion criteria. Sixteen trials were conducted among patients with migraine, six among patients with tension-type headache, and four among patients with various types of headaches. The majority of trials had methodological and/or reporting shortcomings. In eight of the 16 trials comparing true and sham (placebo) acupuncture in migraine and tension-type headache patients, true acupuncture was reported to be significantly superior; in four trials there was a trend in favor of true acupuncture; and in two trials there was no difference between the two interventions. (Two trials were uninterpretable.) The 10 trials comparing acupuncture with other forms of treatment yielded contradictory results.

**Reviewers’ conclusions:** Overall, the existing evidence supports the value of acupuncture for the treatment of idiopathic headaches. However, the quality and amount of evidence are not fully convincing. There is an urgent need for well-planned, large-scale studies to assess the effectiveness and cost-effectiveness of acupuncture under real-life conditions.


**Curr Pain Headache Rep. 2003 Dec;7(6):482-9.**

Physical therapy in the treatment of chronic headache.

Mills Roth J.

Michigan Head Pain & Neurological Institute, 3120 Professional Drive, Ann Arbor,
Careful evaluation of the chronic headache patient can reveal the presence or absence of musculoskeletal factors to be causative or contributory to the headache condition. This article presents a review of the literature surrounding physical findings in patients with cervicogenic and musculoskeletal sources of pain and specific treatment with physical therapy. Included in the discussion is the identification of muscular and joint involvement in a given headache, the relevance of postural, range of motion, and strength deficits, and appropriate individualized treatment strategies with a review of relevant outcome studies. Possible mechanisms for treatment effects also are considered.

**Effectiveness of a physical therapy regimen in the treatment of tension-type headache.**


Hammill JM, Cook TM, Rosecrance JC.

Mercy Medical Center, Cedar Rapids, IA, USA.

Twenty patients with diagnosis of muscle contraction headache were treated for pain relief in a physical therapy clinic once a week for six visits. The previous 3-week period of no treatment served as a control period during which patients recorded by diary their headache frequency, duration, and intensity using a numeric pain scale. Activity level, as measured by the Sickness Impact Profile, and verbal reports of headache frequency, duration, and intensity were recorded at four points during a 1-year period. Measurements were recorded at precontrol, pretreatment, posttreatment, and 12-month follow-up. Treatment included education for posture at home and work place, isotonic home exercise, massage, and stretching to the cervical spine muscles. Results indicated frequency of headaches and Sickness Impact Profile scores were significantly improved (P < 0.001) over the course of treatment. These benefits were maintained after 12 months.

**Maintenance of effects in the nonmedical treatment of headaches during pregnancy.**


Scharff L, Marcus DA, Turk DC.

University of Pittsburgh Pain Evaluation and Treatment Institute, PA 15213, USA.

In a previous study, 30 pregnant women suffering from headaches were treated with physical therapy, relaxation training, and biofeedback. Eighty percent of these women experienced significant relief of headaches following treatment. Although this study demonstrated the effectiveness of nonmedical treatment during pregnancy, little is known about the influence of changing hormones.
during pregnancy on fluctuations in headache. One purpose of this study was to present a follow-up of the women who were included in the previous study to determine whether the results from the nonmedical treatment were maintained up to a year after giving birth. In addition, this study examined the influence of headache diagnosis and breastfeeding on changes in headache activity and maintenance of treatment effects. The results indicate that the reductions in headache activity were maintained at follow-up in the majority of the women treated, with 67.5% of the sample maintaining a significant decrease in headache up to 1 year after giving birth. Neither IHS diagnosis nor breastfeeding was related to maintenance of headache improvement. **We conclude that the beneficial effects of nonpharmacological treatment of headaches during pregnancy demonstrated in a previous study are maintained up to 1 year following delivery.**

Headache diagnosis and breastfeeding were not related to treatment outcome, a finding that contradicts the reports of many retrospective studies.

**Treatment of recurrent tension headache: a meta-analytic review.**


Bogaards MC, ter Kuile MM.

Department of Psychiatry, Leiden University, The Netherlands.

The primary aim of this study was to investigate which treatment, patient, and study characteristics are related to treatment outcome in tension headache. Literature on the subject was obtained by searching for articles published in English through CD-rom Compact Cambridge and PSYCHLIT (1970/1993) on the subjects of headache and tension or muscle contraction in combination with therapy or treatment. Inclusion criteria were prospective design, tension headache, ≥ five subjects per condition; pre- and posttreatment scores available, subjects older than 16 years. Each article was independently reviewed and its data encoded by the two authors. Finally, 78 articles with 175 treated and nontreated conditions (total of 2,866 patients) were selected for this study. Meta-analysis revealed that cognitive therapy, relaxation, or electromyelographic (EMG) biofeedback alone or in combination with relaxation were superior to no treatment and to pseudo/placebo therapy. Pharmacological and other therapies were better than no treatment. However, restricting the analyses to studies using a headache diary, the results of pharmacological therapy were comparable to those of placebo therapy. Moreover, a better treatment outcome was found in studies with a relatively short duration of headache complaints ($r = -0.31$) and with a relatively younger patient sample ($r = -0.22$). The year of publication was negatively related with improvement ($r = -0.36$). No relationship between treatment outcome and other treatment characteristics (duration, transfer of treatment), patient characteristics (gender, method of patient recruitment), and study characteristics (internal validity of the study, criteria for diagnosing tension headache, number of patients, drop-outs) was found. These findings suggest that treatment outcome may be affected more by patient characteristics than by treatment characteristics. Finally, some practical and research implications of these findings are discussed.

**Psychosocial correlates and impact of chronic tension-type headaches.**


Holroyd KA, Stensland M, Lipchik GL, Hill KR, O'Donnell FS, Cordingley G.

Psychology Department, Ohio University, Athens 45701, USA.
OBJECTIVES: To examine the psychosocial correlates of chronic tension-type headache and the impact of chronic tension-type headache on work, social functioning, and well-being. METHODS: Two hundred forty-five patients (mean age = 37.0 years) with chronic tension-type headache as a primary presenting problem completed an assessment protocol as part of a larger treatment outcome study. The assessment included a structured diagnostic interview, the Medical Outcomes Study Short Form, Disability Days/Impairment Ratings, Recurrent Illness Impact Profile, Beck Depression Inventory, State-Trait Anxiety Inventory-Trait Form, Primary Care Evaluation for Mental Disorders, and the Hassles Scale Short Form. Comparisons were made with matched controls (N = 89) and, secondarily, with Medical Outcomes Study data for the general population, arthritis, and back problem samples.

RESULTS: About two thirds of those with chronic tension-type headache recorded daily or near daily (> or =25 days per month) headaches with few (12%) recording headaches on less than 20 days per month. Despite the fact that patients reported that their headaches had occurred at approximately the present frequency for an average of 7 years, chronic tension-type headache sufferers were largely lapsed consulters (54% of subjects) or current consulters in primary care (81% of consulters). Significant impairments in functioning and well-being were evident in chronic tension-type headache and were captured by each of the assessment devices. Although headache-related disability days were reported by 74% of patients (mean = 7 days in previous 6 months), work or social functioning was severely impaired in only a small minority of patients. Sleep, energy level, and emotional well-being were frequently impaired with about one third of patients recording impairments in these areas on 10 or more days per month. Most patients with chronic tension-type headache continued to carry out daily life responsibilities when in pain, although role performance at times was clearly impaired by headaches and well-being was frequently impaired. Chronic tension-type headache sufferers were 3 to 15 times more likely than matched controls to receive a diagnosis of an anxiety or mood disorder with almost half of the patients exhibiting clinically significant levels of anxiety or depression. Affective distress and severity of headaches (Headache Index) were important determinants of headache impact/impairment.

CONCLUSIONS: Chronic tension type headache has a greater impact on individuals’ lives than has generally been realized, with affective distress being an important correlate of impairment. If treatment is to remedy impairment in functioning, affective distress, as well as pain, thus needs to be addressed.


Factors associated with burden of primary headache in a specialty clinic.

Cassidy EM, Tomkins E, Hardiman O, O'Keane V.

Migraine/Headache Clinic, Departments of Psychiatry and Neurology, Beaumont Hospital, Dublin, Ireland.

OBJECTIVE: To examine factors associated with social, occupational, and psychological burden of common primary headache (migraine and tension-type headache). BACKGROUND: The personal and social burden of primary headache is high. Health, occupational, social, and psychological factors contributing to burden in people with disabling headache have not been fully unravelled. METHODS: One hundred eighty consecutive patients with either migraine or tension-type headache attending a specialty headache outpatient clinic for the first time were evaluated over a 9-month period. Headache subtype was operationally defined according to International Headache Society criteria. Headache frequency, duration, and severity were recorded. Occupational and social disability were quantified using the Migraine Disability Assessment questionnaire. Psychological burden was quantified using the 28-item General Health Questionnaire, the Beck Depression Inventory, and the State-Trait Anxiety Inventory. Premorbid vulnerability to life stress was quantified using the neuroticism subscale of the Eysenck Personality Inventory. RESULTS: Patients with frequent (chronic) headache scored higher on the Migraine Disability Index.
Assessment questionnaire and had higher Beck Depression Inventory and General Health Questionnaire depression scores than those with less frequent (episodic) headache. Frequency of headache, but not pain severity, duration, or diagnosis, predicted both Migraine Disability Assessment total disability and General Health Questionnaire/Beck Depression Inventory depression. Neuroticism was predictive of depression but not disability. Patients with chronic migraine had the highest depression and disability scores. CONCLUSION: The number of days per month with headache is a key determinant of headache-related burden in those attending specialty clinics. Frequent (chronic) headache is associated with significantly higher psychopathology scores and general social impairment, but the direction of this relationship is not clear. Those with migraine and chronicity are the most impaired.

Epidemiology of tension-type headache.


Schwartz BS, Stewart WF, Simon D, Lipton RB.

Department of Epidemiology, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Md 21205, USA.

CONTEXT: Tension-type headache is a highly prevalent condition. Because few population-based studies have been performed, little is known about its epidemiology. OBJECTIVES: To estimate the 1-year period prevalence of episodic tension-type headache (ETTH) and chronic tension-type headache (CTTH) in a population-based study; to describe differences in 1-year period prevalence by sex, age, education, and race; and to describe attack frequency and headachepain intensity.

DESIGN: Telephone survey conducted 1993 to 1994. SETTING: Baltimore County, Maryland. PARTICIPANTS: A total of 13 345 subjects from the community. MAIN OUTCOME MEASURES: Percentage of respondents with diagnoses of headache using International Headache Society criteria. Workdays lost and reduced effectiveness at work, home, and school because of headache, based on self-report.

RESULTS: The overall prevalence of ETTH in the past year was 38.3%. Women had a higher 1-year ETTH prevalence than men in all age, race, and education groups, with an overall prevalence ratio of 1.16. Prevalence peaked in the 30- to 39-year-old age group in both men (42.3%) and women (46.9%). Whites had a higher 1-year prevalence than African Americans in men (40.1% vs. 22.8%) and women (46.8% vs 30.9%). Prevalence increased with increasing educational levels in both sexes, reaching a peak in subjects with graduate school educations of 48.5% for men and 48.9% for women. The 1-year period prevalence of CTTH was 2.2%; prevalence was higher in women and declined with increasing education. Of subjects with ETTH, 8.3% reported lost workdays because of their headaches, while 43.6% reported decreased effectiveness at work, home, or school. Subjects with CTTH reported more lost workdays (mean of 27.4 days vs 8.9 days for those reporting lost workdays) and reduced-effectiveness days (mean of 20.4 vs 5.0 days for those reporting reduced effectiveness) compared with subjects with ETTH.

CONCLUSIONS: Episodic tension-type headache is a highly prevalent condition with a significant functional impact at work, home, and school. Chronic tension-type headache is much less prevalent than ETTH; despite its greater individual impact, CTTH has a smaller societal impact than ETTH.
Epidemiology of headache in a general population—a prevalence study.


Rasmussen BK, Jensen R, Schroll M, Olesen J.

Glostrup Population Studies, Department of Internal Medicine C, Glostrup Hospital, University of Copenhagen, Denmark.

We present the first prevalence study of specific headache entities using the operational diagnostic criteria of the International Headache Society. One thousand 25-64 year old men and women, who lived in the western part of Copenhagen County were randomly drawn from the Danish National Central Person Registry. All subjects were invited to a general health examination focusing on headache and including: a self-administered questionnaire concerning sociodemographic variables, a structured headache interview and a general physical and neurological examination. The participation rate was 76%.

Information about 79% of the non-participants showed a slightly differing headache prevalence which was not quantitatively important. The following results in participants are therefore representative of the total sample. The lifetime prevalences of headache (including anybody with any form of headache), migraine, and tension-type headache were 93, 8 and 69% in men; and 99, 25 and 88% in women. The point prevalence of headache was 11% in men and 22% in women. Prevalence of migraine in the previous year was 6% in men and 15% in women and the corresponding prevalences of tension-type headache were 63 and 86%.

Differences according to sex were significant with a male: female ratio of 1:3 in migraine, and 4:5 in tension-type headache. The prevalence of tension-type headache decreased with increasing age, whereas migraine showed no correlation to age within the studied age interval. Headache disorders are extremely prevalent and represent a major health problem, which merits increased attention.

Physiotherapy for tension-type headache: a controlled study.


Torelli P, Jensen R, Olesen J.

Headache Centre, Unit of Neurology, Department of Neuroscience, University of Parma, Strada del Quartiere 4, 43100 Parma, Italy. paolatorelli@libero.it

The role of non-pharmacological therapies in the preventive treatment of tension-type headache (TTH) is still an object of debate. The primary aim of this study was therefore to investigate the therapeutic effect of physiotherapy in properly classified patients with TTH in a controlled trial. Fifty patients with TTH, 26 with episodic, frequent (ETTH) and 24 with chronic TTH (CTTH) fulfilling the International Headache Society classification criteria were included in the study. After a 4-week run-in period, they were randomized to either an 8-week period of standardized physiotherapy (group 1) or to an 8-week observation period followed by an identical course of physiotherapy (group 2); after the physiotherapy all patients were followed for a 12-week follow-up period. We then evaluated the number of days with headache, severity and duration of the headache attacks, and drug consumption for symptomatic treatment before and after the course of physiotherapy. Forty-eight patients completed the study. The average number of days with headache per 4-week period was reduced from 16.3 days at baseline to 12.3 days in the last 4 weeks of treatment [from 14.5 days to 10.5 days (P < 0.001) in group 1 and from 18.1 days to 14.1 days (P < 0.001) in group 2]. Severity and duration of headache as well as drug
consumption were unchanged throughout the study. Analysing the response to
treatment separately in the various subgroups, we found that the number of
responders was significantly higher among patients with CTTH vs. patients with
ETTH (P < 0.002) and in females vs. males (P < 0.02). No differences were found
between patients with and without disorder of pericranial muscles. We conclude
that a standardized physiotherapy programme has a good therapeutic effect,
albeit on a restricted group of patients.

Trigemino-cervical reflex in patients with headache.
Milanov I, Bogdanova D.
Department of Clinical Neurophysiology, University Hospital of Neurology
and
Psychiatry 'St Naum', Sofia, Bulgaria. milanovivan@hotmail.com

Neurophysiological studies have shown abnormal activity of some brainstem
nuclei
in headache patients. The trigemino-cervical reflex is an anti-nociceptive
reflex that gives an opportunity for evaluation of the brainstem
interneurone
activity. It has not been previously examined in headache patients. We
studied
15 patients with predominantly unilateral chronic tension-type headache, 15
patients with migraine without aura and 32 healthy subjects. The
trigemino-cervical reflex was recorded bilaterally from the resting
sternocleidomastoid muscle using surface electromyographic recordings. In
all
headache patients the trigemino-cervical reflex on the painful side was
with
shortened latency compared with the non-painful side and with healthy
persons.
The results suggest decreased activity of the brainstem inhibitory
interneurones. We suggest that although the pathophysiological mechanisms
of
tension-type headache and migraine are different, they share common
mechanisms
of abnormal pain control.
The trigemino-cervical reflex in tension-type headache.
Nardone R, Tezzon F.
Department of Neurology, 'F. Tappeiner' Hospital, Merano (BZ), Italy.
raffaele.nardone@asbmeran-o.it

To investigate the pathophysiology of tension-type headache (TTH) with
special
reference to central mechanisms and to the involvement of the trigeminal
system.
Short latency responses can be recorded in tonically active
sternocleidomastoid
muscle after stimulation of the infraorbital branch of the trigeminal nerve
(the
trigemino-cervical reflex). This brainstem reflex was studied in 15 healthy
subjects, in 15 patients with episodic tension-type headache (ETTH) and in
15
patients with chronic tension-type headache (CTTH) outside of the pain attacks. The trigemino-cervical response was abnormal, in the size or latency, in 13 patients with CTTH and in only one patient with ETTH. This finding strongly suggests that only in the CTTH the underlying pathophysiology involves the trigeminal system. The trigemino-cervical reflex is a sensitive method to evaluate the involvement of the trigeminal brainstem neurones in TTH and their assessment may provide useful diagnostic and prognostic information.

Effectiveness of a physical therapy regimen in the treatment of tension-type headache.


Hammill JM, Cook TM, Rosecrance JC.

Mercy Medical Center, Cedar Rapids, Ia, USA.

Twenty patients with diagnosis of muscle contraction headache were treated for pain relief in a physical therapy clinic once a week for six visits. The previous 3-week period of no treatment served as a control period during which patients recorded by diary their headache frequency, duration, and intensity using a numeric pain scale. Activity level, as measured by the Sickness Impact Profile, and verbal reports of headache frequency, duration, and intensity were recorded at four points during a 1-year period. Measurements were recorded at precontrol, pretreatment, posttreatment, and 12-month follow-up. Treatment included education for posture at home and work place, isotonic home exercise, massage, and stretching to the cervical spine muscles. Results indicated frequency of headaches and Sickness Impact Profile scores were significantly improved (P < 0.001) over the course of treatment. These benefits were maintained after 12 months.


Stanton WR, Jull GA.

Department of Physiotherapy, School of Health and Rehabilitation Sciences, The University of Queensland, Australia.

BACKGROUND: A number of extraneous factors have been implicated in the effectiveness of treatment of headache, including patient beliefs about aspects of the treatment or persons delivering the treatment. OBJECTIVE: The concept of external locus of control for headaches refers to patients with a high level of belief that headache and relief are influenced primarily by health care professionals. The aim of this study was to examine whether external locus of control is associated with a reduction in frequency of cervicogenic headaches among patients treated by a physiotherapist. DESIGN: A recent randomized controlled trial of the effectiveness of physiotherapy among 200 patients with headache enabled a test of this relationship. Treatment consisted of manipulative therapy, therapeutic exercise, or a combination of the 2. Analysis of relative change in headache frequency was conducted after 6 weeks of treatment and at 3- and 12-month follow-up appointments. RESULTS: Results of the analysis indicated that participants with relatively high external Headache-Specific Locus of Control scores were more likely to achieve a reduction in headache frequency if they received the combined manipulative
therapy and exercise therapy, compared with those who received no treatment. This was not determined for the group who received manipulative therapy, which is a treatment received passively by the patient. CONCLUSIONS: The interpretation of these findings is considered in the context of nongeneralization to the other physiotherapy treatment groups and sustained reduction in headache frequency following withdrawal of treatment. The pattern of findings suggests that characteristics of the therapy were more pertinent than characteristics of the therapist.

Effect of autogenic training on drug consumption in patients with primary headache: an 8-month follow-up study.

Zsombok T, Juhasz G, Budavari A, Vitrail J, Bagdy G.

Laboratory of Neurochemistry and Experimental Medicine, and the Department of Vascular Neurology, Semmelweis University National Institute of Psychiatry and Neurology, Budapest, Hungary.

OBJECTIVE: To examine the effects of Schultz-type autogenic training on headache-related drug consumption and headache frequency in patients with migraine, tension-type, or mixed (migraine plus tension-type) headache over an 8-month period. BACKGROUND: Behavioral treatments often are used alone or adjunctively for different types of headache. There are, however, only a few studies that have compared the efficacy and durability of the same treatment in different types of primary headache, and the effects of treatment on headache-related drug consumption rarely have been assessed even in these studies. METHODS: Twenty-five women with primary headache (11 with mixed headache, 8 with migraine, and 6 with tension-type headache) were evaluated via an open-label, self-controlled, 8-month, follow-up study design. After an initial 4 months of observation, patients began learning Schultz-type autogenic training as modified for patients with headache. They practiced autogenic training on a regular basis for 4 months. Based on data from headache diaries and daily medication records, headache frequencies and the amounts of analgesics, "migraine-specific" drugs (ergots and triptans), and anxiolytics taken by the patients were compared in the three subgroups over the 8-month period. Results: From the first month of implementation of autogenic training, headache frequencies were significantly reduced in patients with tension-type and mixed headache. Significant reduction in frequency was achieved in patients with migraine only from the third month of autogenic training. Decreases in headache frequencies were accompanied by decreases in consumption of migraine drugs and analgesics resulting in significant correlations among these parameters. Reduction in consumption of anxiolytic drugs was more rapid and robust in patients with tension-type headache compared to patients with migraine, and this outcome failed to show any correlation with change in headache frequency. CONCLUSION: Schultz-type autogenic training is an effective therapeutic approach that may lead to a reduction in both headache frequency and the use of headache medication.


Cervicogenic headaches: a critical review.


Haldeman S, Dagenais S.
BACKGROUND CONTEXT: The notion that headaches may originate from disorders of the cervical spine and can be relieved by treatments directed at the neck is gaining recognition among headache clinicians but is often neglected in the spine literature. PURPOSE: To review and summarize the literature on cervicogenic headaches in the following areas: historical perspective, diagnostic criteria, epidemiology, pathogenesis, differential diagnosis, and treatment. STUDY DESIGN/SETTING: A systematic literature review of cervicogenic headache was performed. METHODS: Three computerized medical databases (Medline, Cumulative Index to Nursing and Allied Health Literature [CINAHL], Mantis) were searched for the terms "cervicogenic" and "headache." After cross-referencing, we retrieved 164 unique citations; 48 citations were added from other sources, for a total of 212 citations, although all were not used. RESULTS: Hilton described the concept of headaches originating from the cervical spine in 1860. In 1983 Sjaastad introduced the term "cervicogenic headache" (CGH). Diagnostic criteria have been established by several expert groups, with agreement that these headaches start in the neck or occipital region and are associated with tenderness of cervical paraspinal tissues. Prevalence estimates range from 0.4% to 2.5% of the general population to 15% to 20% of patients with chronic headaches. CGH affects patients with a mean age of 42.9 years, has a 4:1 female disposition, and tends to be chronic. Almost any pathology affecting the cervical spine has been implicated in the genesis of CGH as a result of convergence of sensory input from the cervical structures within the spinal nucleus of the trigeminal nerve. The main differential diagnoses are tension type headache and migraine headache, with considerable overlap in symptoms and findings between these conditions. No specific pathology has been noted on imaging or diagnostic studies which correlates with CGH. CGH seems unresponsive to common headache medication. Small, noncontrolled case series have reported moderate success with surgery and injections. A few randomized controlled trials and a number of case series support the use of cervical manipulation, transcutaneous electrical nerve stimulation, and botulinum toxin injection. CONCLUSIONS: There remains considerable controversy and confusion on all matters pertaining to the topic of CGH. However, the amount of interest in the topic is growing, and it is anticipated that further research will help to clarify the theory, diagnosis, and treatment options for patients with CGH. Until then, it is essential that clinicians maintain an open, cautious, and critical approach to the literature on cervicogenic headaches.

**Impact of migraine and tension-type headache on life-style, consulting behaviour, and medication use: a Canadian population survey.**

**Can J Neurol Sci. 1993 May;20(2):131-7.**


Department of Neurology, University of Toronto, Ontario, Canada.

A large sample of Canadian adults was surveyed by telephone to determine the prevalence and characterization of headache, and the effects of headache on life-style, consulting behaviours and medication use. We reported prevalence and characterization in a previous issue; here, we detail the effects of headaches on sufferers. Sixteen and one-half percent of adult Canadians experience migraine and 29% tension-type headaches. In over 70% of headache sufferers interpersonal relationships are impaired. Regular activities are limited in 78% of migraine attacks and 38% of tension-type headaches. Despite this, only 64% of migraine and 45% of tension-type headache sufferers had ever sought medical attention, and of these only 32% returned for ongoing care. Fourteen
percent of migraine and 8% of tension-type headache sufferers had used emergency departments. Most headache sufferers take medication, primarily over-the-counter varieties. Measures to reach the headache population are needed, as are safe effective treatment options that will encourage them to participate in their medical care.

**Medication patterns of recurrent headache sufferers: a community study.**


Forward SP, McGrath PJ, MacKinnon D, Brown TL, Swann J, Currie EL.

Department of Psychology, Dalhousie University, Halifax, Nova Scotia, Canada.

This community-based telephone survey determined medication patterns of 274 frequent headache sufferers who reported 12 or more headaches a year. Headaches were classified using the International Headache Society's (IHS) criteria.

Participants reported on 465 types of headaches: 129 tension headaches, 158 migraine headaches, 8 chronic tension headaches, and 148 headaches which were unclassifiable using IHS criteria. Females (n = 133) reported an average of 1.9 types of headache and males (n = 141) reported 1.5 headache types. Fifty-six percent of respondents used acetaminophen for tension-type and 60% used acetaminophen for migraine. One percent used prescription medication for tension headache and 12% used prescriptions for migraine. The perceived effectiveness of over-the-counter medication was approximately 7 on a scale of 0-10 for tension headaches and 6 for migraine. Both tension-headache and migraine-headache sufferers waited about 1 h before taking any medication. Tension-headache sufferers waited until the headache was above 5 on a 0 to 10 scale (4.6 for migraine). It is possible that more aggressive use of medication might improve headache management.

**Epidemiology of headache in an English district.**

*Cephalalgia. 2003 Mar;23(2):129-37.*

Boardman HF, Thomas E, Croft PR, Millson DS.

Department of Medicines Management and Primary Care Sciences Research Centre, Keele University, UK. h.f.boardman@keele.ac.uk

Headache prevalence, characteristics and impact in adults were measured using a cross-sectional general population survey in North Staffordshire, UK. A postal survey was mailed out to 4885 adults (aged > or = 18 years) with an adjusted response rate of 56% (n = 2662). Of respondents 93% reported headache ever and 70% in the last 3 months. Women and younger people reported higher headache prevalences. Of those reporting headache in the last 3 months, 23% experienced headache at least weekly and 16% experienced severe headache pain. Headaches affected work, home or social activities in 43% of sufferers and 20% reported at least moderate headache-related disability. Higher levels of disability were associated with higher levels of pain, 61% with severe disability reporting severe pain compared with 13% who had mild or moderate disability. In the total adult population sample headache affected more than two-thirds in the last 3 months and 14% of all adults reported headache-related disability of at leastmoderate level, which translates to a large burden in the general population.

**Prevalence of migraine and non-migrainous headache--head-HUNT, a large population-based study.**


Hagen K, Zwart JA, Vatten L, Stovner LJ, Bovim G.
The objective of this study was to estimate the 1-year prevalence of the following categories of headache; migraine, non-migrainous headache, frequent headache (>6 days/month), and chronic headache (>14 days/month). Between 1995 and 1997, all 92,566 inhabitants 20 years and older in Nord-Trondelag county in Norway were invited to a comprehensive health study. Out of 64,560 participants, a total of 51,383 subjects (80%) completed a headache questionnaire. The overall age-adjusted 1-year prevalence of headache was 38% (46% in women and 30% in men). The prevalence of migraine was 12% (16% in women and 8% in men), and for non-migrainous headache 26% (30% in women and 22% in men). For frequent headache (> 6 days per month) and for chronic headache (>14 days per month), the prevalence was 8% and 2%, respectively. Women had a higher prevalence than men in all age groups and for all headache categories. Prevalence peaked in the fourth decade of life for both men and women, except for 'frequent non-migrainous headache', which was nearly constant across all age groups in both genders. In accordance with findings in other western countries, we found that headache suffering, including migraine, was highly prevalent, especially in younger women.

The co-occurrence of headache and musculoskeletal symptoms amongst 51 050 adults in Norway.


Hagen K, Einarsen C, Zwart JA, Svebak S, Bovim G.

Department of Clinical Neuroscience, Section of Neurology, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway.
knut.hagen@medisin.ntnu.no

We have evaluated the association between headache and musculoskeletal symptoms in a large cross-sectional population-based study. Between 1995 and 1997, all 92 566 adults in Nord-Trondelag County in Norway were invited to participate in a health survey. A total of 51 050 (55%) responded to questions concerning headache and musculoskeletal symptoms. Both migraine and non-migrainous headache were strongly associated with musculoskeletal symptoms. However, frequency of headache had a higher impact than headache diagnosis on this association. Thus, the prevalence of chronic headache (headache >14 days/month) was more than four times higher (OR = 4.6; 95% CI 4.0-5.3) in the group of individuals with musculoskeletal symptoms than in those without. Individuals with neck pain were more likely to suffer from headache as compared with those with musculoskeletal symptoms in other restricted areas. In conclusion, there was a strong association between chronic headache and musculoskeletal symptoms, which may have implications for the choice of treatment.

Epidemiology of tension-type headache.


Schwartz BS, Stewart WF, Simon D, Lipton RB.

Department of Epidemiology, Johns Hopkins University, School of Hygiene and Public Health, Baltimore, Md 21205, USA.

CONTEXT: Tension-type headache is a highly prevalent condition. Because few population-based studies have been performed, little is known about its
epidemiology. OBJECTIVES: To estimate the 1-year period prevalence of episodic tension-type headache (ETTH) and chronic tension-type headache (CTTH) in a population-based study; to describe differences in 1-year period prevalence by sex, age, education, and race; and to describe attack frequency and headache pain intensity. DESIGN: Telephone survey conducted 1993 to 1994. SETTING: Baltimore County, Maryland. PARTICIPANTS: A total of 13,345 subjects from the community. MAIN OUTCOME MEASURES: Percentage of respondents with diagnoses of headache using International Headache Society criteria. Workdays lost and reduced effectiveness at work, home, and school because of headache, based on self-report. RESULTS: The overall prevalence of ETTH in the past year was 38.3%. Women had a higher 1-year ETTH prevalence than men in all age, race, and education groups, with an overall prevalence ratio of 1.16. Prevalence peaked in the 30- to 39-year-old age group in both men (42.3%) and women (46.9%). Whites had a higher 1-year prevalence than African Americans in men (40.1% vs. 22.8%) and women (46.8% vs 30.9%). Prevalence increased with increasing educational levels in both sexes, reaching a peak in subjects with graduate school educations of 48.5% for men and 48.9% for women. The 1-year period prevalence of CTTH was 2.2%; prevalence was higher in women and declined with increasing education. Of subjects with ETTH, 8.3% reported lost workdays because of their headaches, while 43.6% reported decreased effectiveness at work, home, or school. Subjects with CTTH reported more lost workdays (mean of 27.4 days vs 8.9 days for those reporting lost workdays) and reduced-effectiveness days (mean of 20.4 vs 5.0 days for those reporting reduced effectiveness) compared with subjects with ETTH. CONCLUSIONS: Episodic tension-type headache is a highly prevalent condition with a significant functional impact at work, home, and school. Chronic tension-type headache is much less prevalent than ETTH; despite its greater individual impact, CTTH has a smaller societal impact than ETTH.

Does chronic daily headache arise de novo in association with regular use of analgesics?


Bahra A, Walsh M, Menon S, Goadsby PJ.

Headache Group, Institute of Neurology and The National Hospital for Neurology and Neurosurgery, Queen Square, London, UK.

BACKGROUND: The prevalence of chronic daily headache in association with regular use of analgesics is about 2%. Whether regular use of analgesics has a causal or consequential relationship to daily headache has not been established. A causal relationship has been suggested consequent to the observation of improvement or resolution of headache following analgesic withdrawal in patients attending headache clinics, but this observation has not been validated by controlled trials. PURPOSE: The aim of our investigation was to determine whether regular use of analgesics is associated with the development of chronic daily headache de novo and to characterize the clinical phenotype of those headaches by carefully studying chronic daily headache in patients with regular use of analgesics for a nonheadache indication. METHODS: Patients attending a rheumatology-monitoring clinic of second-line agents were interviewed by a training neurologist with regard to their analgesic and headache history. Headache classification was according to the criteria of the International Headache Society. Daily headache characteristics were surveyed via a standardized questionnaire, and headache features were further explored by a trained medical interviewer. RESULTS: Of 110 patients presenting to a rheumatology-monitoring clinic, 73% had a diagnosis of rheumatoid arthritis, 23%
had seronegative arthritis, and 4% comprised a miscellaneous group. One hundred three were using one or more analgesics regularly for their arthritis. Of this group, 8 (7.6%) reported a history of chronic daily headache, each of whom reported a history of migraine. The onset of migraine occurred before the onset of chronic daily headache in 7 patients and at about the same time as the chronic daily headache in 1 patient. In those with onset of migraine prior to chronic daily headache, the mean interval before the onset of headache was 30 years (range, 10 to 50 years). Regular use of analgesics preceded the onset of daily headache in 5 patients by a mean of 5.4 years (range, 2 to 10 years). In 1 patient, analgesic use and the development of daily headache occurred at about the same time. In 1 patient, the onset of daily headache preceded regular use of analgesics by almost 30 years. Five of those with regular use of analgesics had been taking an opiate-based preparation in combination with a nonsteroidal anti-inflammatory agent in 4. Two had been on a combination of acetaminophen (paracetamol) and a nonsteroidal anti-inflammatory drug. The minimum number of tablets per week was 7, and the mean was 48 (range, 7 to 87). Of those patients who did not have daily headache, 41% had a history of migraine and 27% reported a history of tension-type headache.

CONCLUSION: These findings suggest that individuals with primary headache, specifically migraine, are predisposed to developing chronic daily headache in association with regular use of analgesics.

Tension-type headache.


Millea PJ, Brodi EJ

Department of Family and Community Medicine, Medical College of Wisconsin, Milwaukee 53226-0509, USA. pmillea@mail.mcw.edu

Tension-type headache typically causes pain that radiates in a band-like fashion bilaterally from the forehead to the occiput. Pain often radiates to the neck muscles and is described as tightness, pressure, or dull ache. Migraine-type features (unilateral, throbbing pain, nausea, photophobia) are not present. All patients with frequent or severe headaches need careful evaluation to exclude any occult serious condition that may be causing the headache. Neuroimaging is not needed in patients who have no worrisome findings on examination. Treatment of tension-type headache typically involves the use of over-the-counter analgesics. Use of pain relievers more than twice weekly places patients at risk for progression to chronic daily headache. Sedating antihistamines or antiemetics can potentiate the pain-relieving effects of standard analgesics. Analgesics combined with butalbital or opiates are often useful for tension-type pain but have an increased risk of causing chronic daily headache. Amitriptyline is the most widely researched prophylactic agent for frequent headaches. No large trials with rigorous methodologies have been conducted for most non-medication therapies. Among the commonly employed modalities are biofeedback, relaxation training, self-hypnosis, and cognitive therapy.

Analgesic overuse among subjects with headache, neck, and low-back pain.


Zwart JA, Dyb G, Hagen K, Svebak S, Stovner LJ, Holmen J.

Department of Clinical Neuroscience, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway. john-anker.zwart@medisin.ntnu.no
OBJECTIVES: To examine the prevalence of chronic headache (> or =15 days/month) associated with analgesic overuse in relation to age and gender and the association between analgesic overuse and chronic pain (i.e., migraine, nonmigrainous headache, neck and low-back pain). METHODS: In the Nord-Trondelag Health Study 1995 to 1997 (HUNT-2), a total of 51,383 subjects responded to headache questions (Head-HUNT), of which 51,050 completed questions related to musculoskeletal symptoms and 49,064 questions regarding the use of analgesics. RESULTS: The prevalence of chronic headache associated with analgesic use daily or almost daily for > or =1 month was 1% (1.3% for women and 0.7% for men) and for analgesic overuse duration of > or =3 months 0.9% (1.2% for women and 0.6% for men). Chronic headache was more than seven times more likely among those with analgesic overuse (> or =1 month) than those without (odds ratio [OR] = 7.5, 95% CI: 6.6 to 8.5). Upon analysis of the different chronic pain subgroups separately, the association with analgesic overuse was strongest for chronic migraine (OR = 10.3, 95% CI: 8.1 to 13.0), intermediate for chronic nonmigrainous headache (OR = 6.2, 95% CI: 5.3 to 7.2), and weakest for chronic neck (OR = 2.6, 95% CI: 2.3 to 2.9) and chronic low-back (OR = 3.0, 95% CI: 2.7 to 3.3) pain. The association became stronger with increasing duration of analgesic use for all groups and was most evident among those with headache, especially those with migraine. CONCLUSIONS: Chronic headache associated with analgesic overuse is prevalent and especially chronic migraine is more strongly associated with frequent intake of analgesics than other common pain conditions like chronic neck and chronic low-back pain.

Chronic daily headache with analgesic overuse: epidemiology and impact on quality of life.

Colas R, Munoz P, Temprano R, Gomez C, Pascual J.

Health Center of Santona, University Hospital Marques de Valdecilla (UC), Cantabria, Spain.

OBJECTIVE: To analyze the prevalence and demography of chronic daily headache (CDH) with analgesic overuse. METHODS: A population of 9,984 inhabitants aged 14 or older living in Santona, Spain, was studied. The authors personally interviewed 4,855 subjects, using a quota sampling approach. Those with headache
for > or = 10 days/month and some analgesic use were asked to fill in a diary over the course of 1 month. Then, subjects were classified into CDH with or without analgesic overuse subtypes. Quality of life (Short Form-36 Health Survey [SF-36]) was also assessed in this second interview. RESULTS: Headache for > or = 10 days/month with analgesic consumption was reported by 332 subjects. Seven had secondary headache. Seventy-four (standardized prevalence 1.41%, 95% CI 1.1 to 1.8) fulfilled criteria for CDH with analgesic overuse. Prevalence in women (2.6%, 2.0 to 3.3) was much higher than in men (0.19%, 0.006 to 0.52). Mean age was 56 years (range 19 to 82 years). As recalled by the subjects, the mean age at onset of CDH was 38 years (range 9 to 82 years), whereas the mean age at onset of CDH with frequent analgesic consumption was 45 years (range 19 to 80 years) and that of primary headache was 22 years (range 5 to 60 years). CDH subjects showed a significant decrease in each SF-36 health-related score as compared with healthy control subjects. Transformed migraine was diagnosed in 49 (prevalence 0.9%), chronic tension-type headache in 20 (0.4%), and new daily persistent headache in 5 (0.1%). Thirty-five percent of patients overused simple analgesics, 22% ergotics, 12.5% opioids, and 2.7% triptans; the remaining 27.8% were overusing different combinations. CONCLUSION: CDH with analgesic overuse is a common disorder in the general population, mainly in women in their fifties, in whom 5% meet its diagnostic criteria.

The prevalence of migraine and tension-type headaches among adolescents in Norway. The Nord-Trondelag Health Study (Head-HUNT-Youth), a large population-based epidemiological study.


Zwart JA, Dyb G, Holmen TL, Stovner LJ, Sand T.

Department of Clinical Neuroscience, Faculty of Medicine, Norwegian University of Science and Technology, Trondheim, Norway. John-Anker.Zwart@medisin.ntnu.no
The aim of this study was to examine the prevalence of headache and primary headache disorders like migraine and tension-type headaches among adolescents, and to explore the differences in headache prevalence and frequency by gender and age. This cross-sectional study was conducted in Nord-Trondelag county, Norway, during the years 1995-97. In total, 8984 (88%) out of 10 202 invited adolescents aged 12-19 years participated in the youth part of the Nord-Trondelag Health Study [Helseundersøkelsen i Nord-Trondelag (HUNT)]. The total study population in this study consisted of 8255 individuals after exclusion of invalid questionnaires and students outside the target range of 13-18 years of age. The students completed a comprehensive questionnaire, and one of the questions was whether the students had experienced any headaches during the last 12 months. In addition, 5847 of these students were also subject to an interview in which they were asked whether they had experienced recurring headaches during the last year and, if so, were they classified as migraine (M1), tension-type headache (TTH) or non-classifiable headache. In the total questionnaire-based population, 76.8% reported having had headaches during the last 12 months (69.4% boys and 84.2% girls). Among those who also were interviewed, 29.1% reported having recurrent headaches (21.0% boys and 36.5% girls). The overall 1-year prevalence of migraine was 7%, of tension-type headache 18%, and of non-classifiable headache 4.8%. Higher prevalence rates were found for girls in all age groups and for all headache categories. The overall frequency of recurrent headaches did not vary significantly with age, but girls had significantly more frequent headaches than boys. We concluded that headache in general, and recurrent primary headache disorders like migraine and tension-type headaches, are common somatic complaints among Norwegian adolescents, especially among girls.

Epidemiology of chronic daily headache.


Pascual J, Colas R, Castillo J.

Service of Neurology, University Hospital Marques de Valdecilla, Santander 39008, Spain. pascualj@unican.es
Daily or near-daily headache is a widespread problem in clinical practice. The general term of chronic daily headache (CDH) encompasses those primary headaches presenting more than 15 days per month and lasting more than 4 hours per day. CDH includes transformed migraine (TM), chronic tension-type headache (CTTH), new daily persistent headache (NDPH), and hemiancrania continua (HC). Around 40% of patients attending a specialized headache clinic meet CDH diagnostic criteria, of which 80% are women. In these clinics about 60% of patients suffer from TM, 20% from CTTH, and 20% meet NDPH criteria. Most, some 80%, overuse symptomatic medications. One should be very cautious on extrapolating these numbers to the general population. CDH prevalence in the general population seems to be around 4% to 5% (up to 8% to 9% for women). Regarding the prevalence of CDH subtypes, NDPH is rare (0.1%), whereas the prevalence of TM (1.5% to 2%) and CTTH (2.5% to 3%) is clearly higher. In contrast to data from specialized clinics, only around a quarter of CDH subjects in the general population overuse analgesics; the prevalence of CDH subjects with analgesic overuse being 1.1% to 1.9% of the general population. Most of these patients with analgesic overuse are TM patients.

Transformed migraine and medication overuse in a tertiary headache centre -clinical characteristics and treatment outcomes.


Bigal M, Rapoport A, Sheftell F, Tepper S, Lipton R.

Department of Neurology, Albert Einstein College of Medicine, New York.
Studies suggest that a substantial proportion of headache sufferers presenting to headache clinics may overuse acute medications. In some cases, overuse may be responsible for the development or maintenance of a chronic daily headache (CDH) syndrome. The objectives of this study are to evaluate patterns of analgesic overuse in patients consulting a headache centre and to compare the outcomes in a group of patients who discontinued medication overuse to those of a group who continued the overuse, in patients with similar age, sex and psychological profile. We reviewed charts of 456 patients with transformed migraine (TM) and acute medication overuse defined by one of the following criteria: 1. Simple analgesic use (>1000 mg ASA/acetaminophen) > 5 days/week; 2. Combination analgesics use (caffeine and/or butalbital) > 3 tablets a day for > 3 days a week; 3. Opiate use > 1 tablet a day for > 2 days a week; 4. Ergotamine tartrate use: 1 mg PO or 0.5 mg PR for > 2 days a week. For triptans, we empirically considered overuse > 1 tablet per day for > 5 days per week. Patients who were able to undergo detoxification and did not overuse medication (based on the above definition) after one year of follow-up were considered to have successful detoxification (Group 1). Patients who were not able to discontinue offending agents, or returned to a pattern of medication overuse within one year were considered to have unsuccessful detoxification (Group 2). We compared the following outcomes after one year of follow-up: Number of days with headache per month; Intensity of headache; Duration of headache; Headache score (frequency x intensity). The majority of patients overused more than one type of medication. Numbers of tablets taken ranged from 1 to 30 each day (mean of 5.2). Forty-eight (10.5%) subjects took >10 tablets per day. Considering patients seen in the last 5 years, we found the following overused substances: Butalbital containing combination products, 48%; Acetaminophen, 46.2%; Opioids, 33.3%; ASA, 32.0%; Ergotamine tartrate, 11.8%; Sumatriptan, 10.7%; Nonsteroidal anti-inflammatory medications other than ASA, 9.8%; Zolmitriptan, 4.6%; Rizatriptan, 1.9%; Naratriptan, 0.6%. Total of all triptans, 17.8%. Of 456 patients, 318 (69.7%) were successfully detoxified (Group 1), and 138 (30.3%) were not (Group 2). The comparison between groups 1 and 2 after one year of follow-up showed a decrease in the frequency of headache of 73.7% in group 1 and only 17.2% in group 2 (P < 0.0001). Similarly, the duration of headache was reduced by 61.2% in group 1 and 14.8% in group 2 (P < 0.0001). The headache score after one year was 18.8 in group 1 and 54 in group 2 (P < 0.0001). A total of 225 (70.7%) successfully detoxified subjects in Group 1 returned to an episodic pattern of migraine, compared to 21 (15.3%) in Group 2 (P < 0.001). More rigorous prescribing guidelines for patients with frequent headaches are urgently needed. Successful detoxification is necessary to ensure improvement in the headache status when treating patients who overuse acute medications.

Quality of life in chronic daily headache: a study in a general population.


Guitera V, Munoz P, Castillo J, Pascual J.

Service of Neurology, University Hospital Marques de Valdecilla, Santander.
Spain.

OBJECTIVE: To analyze the quality of life (QoL) of subjects with chronic daily headache (CDH) in the general population. METHODS: QoL was studied, using the generic instrument Short Form-36 (SF-36), in 89 unselected subjects from an epidemiologic study in the general population who fulfilled CDH criteria. SF-36 scores were adjusted for comorbid conditions. A total of 89 healthy matched subjects were recruited as a control group. An additional matched group of 89 otherwise healthy subjects with episodic migraine was recruited as controls only to those with transformed migraine (TM). RESULTS: CDH subjects showed a significant decrease in each health-related concept of the SF-36 as compared with healthy subjects. The highest decreases were seen for role physical, bodily pain, vitality, and social functioning. There was no significant difference in SF-36 scores in subjects with chronic tension-type headache as compared with TM subjects. TM individuals showed lower values in each health-related concept when compared with patients with episodic migraine, these decreases being significant for general health, vitality, and mental health. Finally, CDH subjects without analgesic overuse showed higher values in each concept of the SF-36 than those with analgesic overuse. Despite the low proportion of abusers in this study, differences were significant for physical functioning and bodily pain. CONCLUSIONS: In the general population, CDH reduced all QoL aspects studied with the SF-36. This reduction in QoL was most marked in subjects with analgesic overuse. QoL was affected more by the chronicity than by the intensity of pain.

Successful withdrawal from analgesic abuse in a group of youngsters with chronic daily headache.


Hering-Hanit R, Gadoth N, Cohen A, Horev Z.

Department of Neurology, Meir General Hospital, Sapir Medical Centre, Kfar Saba,
Abuse of ergotamine and analgesics is common in adults. It coexists with headache and can also induce headaches. Ten to 15% of patients attending headache clinics and 1% of the general population suffer from chronic daily headache due to medication misuse. Indeed, this phenomenon was recently regarded as an epidemic. Nonetheless, analgesic-induced headache in children and adolescents was first reported in 1998. We report on our experience with children and adolescents with daily or almost-daily headache concomitant with daily or almost-daily analgesic intake. Over a period of 3 years, we evaluated 26 children (19 girls and 7 boys) with chronic daily or near-daily headache related to daily analgesic intake. The mean age of the group was 14.2 years (range, 12-18), and the mean headache history duration was 1.6 years (range, 3 months to 4 1/2 years). The mean number of headache days per month was 28.1 (range, 19-31). All patients had no history of migraine prior to the chronic headache phase according to the International Headache Society criteria. They were using at least one dose of analgesic drug for each headache, whereas 16 were using analgesic drugs daily. The weekly analgesic intake averaged 28.1 tablets (range, 19-41). The majority abused simple analgesics. Twenty-one took acetaminophen alone. Five took a combination; four took a compound containing acetaminophen, caffeine, and codeine; and the fifth patient took a compound containing aspirin, caffeine, and codeine. All patients were informed about the phenomenon of medication-induced headache and were encouraged to achieve drug withdrawal. Withdrawal led to complete cessation of all headaches in 20 patients. In 5 patients, the daily headache resolved; however, they suffered from intermittent episodic migraine attacks, which were frequent enough in 3 to initiate prophylactic medication. One adolescent continued to have daily headache. Analgesic-induced headache does occur in adolescents. Successful withdrawal from the offending analgesics was achieved without hospitalization or significant interference with daily life and with complete disappearance of the induced chronic daily headache in 25 of 26 patients.

Does chronic daily headache arise de novo in association with regular use of analgesics?


Bahra A, Walsh M, Menon S, Goadsby PJ.
BACKGROUND: The prevalence of chronic daily headache in association with regular use of analgesics is about 2%. Whether regular use of analgesics has a causal or consequential relationship to daily headache has not been established. A causal relationship has been suggested consequent to the observation of improvement or resolution of headache following analgesic withdrawal in patients attending headache clinics, but this observation has not been validated by controlled trials. PURPOSE: The aim of our investigation was to determine whether regular use of analgesics is associated with the development of chronic daily headache de novo and to characterize the clinical phenotype of those headaches by carefully studying chronic daily headache in patients with regular use of analgesics for a nonheadache indication. METHODS: Patients attending a rheumatology-monitoring clinic of second-line agents were interviewed by a training neurologist with regard to their analgesic and headache history. Headache classification was according to the criteria of the International Headache Society. Daily headache characteristics were surveyed via a standardized questionnaire, and headache features were further explored by a trained medical interviewer. RESULTS: Of 110 patients presenting to a rheumatology-monitoring clinic, 73% had a diagnosis of rheumatoid arthritis, 23% had seronegative arthritis, and 4% comprised a miscellaneous group. One hundred three were using one or more analgesics regularly for their arthritis. Of this group, 8 (7.6%) reported a history of chronic daily headache, each of whom reported a history of migraine. The onset of migraine occurred before the onset of chronic daily headache in 7 patients and at about the same time as the chronic daily headache in 1 patient. In those with onset of migraine prior to chronic daily headache, the mean interval before the onset of headache was 30 years (range, 10 to 50 years). Regular use of analgesics preceded the onset of daily headache in 5 patients by a mean of 5.4 years (range, 2 to 10 years). In 1 patient, analgesic use and the development of daily headache occurred at about the same time. In 1 patient, the onset of daily headache preceded regular use of analgesics by almost 30 years. Five of those with regular use of analgesics had been taking an opiate-based preparation in combination with a nonsteroidal anti-inflammatory agent in 4. Two had been on a combination of acetaminophen (paracetamol) and a nonsteroidal anti-inflammatory drug. The minimum number of tablets per week was 7, and the mean was 48 (range, 7 to 87). Of those patients who did not have daily headache, 41% had a history of migraine and 27% reported a history of tension-type headache. CONCLUSION: These findings suggest that individuals with primary headache, specifically migraine, are predisposed to developing chronic daily headache in association with regular use of analgesics.

Cervicogenic headache: practical approaches to therapy.


Martelletti P, van Suijlekom H.

Department of Internal Medicine, 2nd School of Medicine, Headache Centre, University La Sapienza, 00189 Rome, Italy. Paolo.Martelletti@uniroma1.it

Cervicogenic headache is a relatively common and still controversial form of headache arising from structures in the neck. The estimated prevalence of the
disorder varies considerably, ranging from 0.7% to 13.8%. Cervicogenic headache is a 'side-locked' or unilateral fixed headache characterised by a non-throbbing pain that starts in the neck and spreads to the ipsilateral oculo-fronto-temporal area. In patients with this disorder, attacks or chronic fluctuating periods of neck/head pain may be provoked/worsened by sustained neck movements or stimulation of ipsilateral tender points. The pathophysiology of cervicogenic headache probably depends on the effects of various local pain-producing or eliciting factors, such as intervertebral dysfunction, cytokines and nitric oxide. Frequent coexistence of a history of head traumas suggests these also play an important role. A reliable diagnosis of cervicogenic headache can be made based on the criteria established in 1998 by the Cervicogenic Headache International Study Group. Positive response after an appropriate nerve block is an essential diagnostic feature of the disorder. Differential diagnoses of cervicogenic headache include hemicrania continua, chronic paroxysmal hemicrania, occipital neuralgia, migraine and tension headache. Various therapies have been used in the management of cervicogenic headache. These range from lowly invasive, drug-based therapies to highly invasive, surgical-based therapies. This review evaluates use of drug therapy with paracetamol and NSAIDs, infliximab and botulinum toxin type A; manual modalities and transcutaneous electrical nerve stimulation therapy; local injection of anaesthetic or corticosteroids; and invasive surgical therapies for the treatment of cervicogenic headache. A curative therapy for cervicogenic headache will not be developed until increased knowledge of the aetiology and pathophysiology of the condition becomes available. In the meantime, limited evidence suggests that therapy with repeated injections of botulinum toxin type A may be the most safe and efficacious approach. The surgical approach, which includes decompression and radiofrequency lesions of the involved nerve structures, may also provide physicians with further options for refractory cervicogenic headache patients. Unfortunately, the paucity of experimental models for cervicogenic headache and the relative lack of biomolecular markers for the condition mean much is still unclear about cervicogenic headache and the disorder remains inadequately treated.

Epidemiology of migraine and other types of headache in Asia.


Wang SJ.

Neurological Institute, Taipei Veterans General Hospital, 112, Taipei, Taiwan.
sjwang@vghtpe.gov.tw
Earlier studies have raised the issue that Asians have a much lower migraine prevalence than Westerners. This article reviews the recent epidemiologic studies of headache in Asia using International Headache Society (IHS) classification criteria. Except for the Korean study and the first Hong Kong study (1992 to 1993), the prevalence of migraine has been quite consistent, ranging from 8.4% to 12.7%. The sex-specific migraine prevalence was 11.3% to 14.4% in women and 3.6% to 6.7% in men. The prevalence of IHS tension-type headache has also been similar among these studies (15.6% to 25.7%). The consistency of the prevalence of migraine and tension-type headache among these Asian countries is interesting in a region where the cultural background and development are so diverse. These IHS migraine surveys show that migraine is a significant disease in Asia and that its prevalence rate is close to but in the low range of the those reported in Western countries. Two surveys of chronic daily headache conducted in Taiwan, one in the general population and the other in the elderly population, have also revealed prevalence rates (3.2% to 3.9%) similar to those of Western countries (3.0% to 4.7%). The geographic or ethnic diversity of migraine or other types of headache could be downplayed if a similar epidemiologic methodology and an identical case definition were used in the surveys among different regions of the world.

Publication Types:
- Review
- Review, Tutorial

**Epidemiology of headache in a general population--a prevalence study.**


Rasmussen BK, Jensen R, Schroll M, Olesen J.

Glostrup Population Studies, Department of Internal Medicine C, Glostrup Hospital, University of Copenhagen, Denmark.
We present the first prevalence study of specific headache entities using the operational diagnostic criteria of the International Headache Society. One thousand 25-64 year old men and women, who lived in the western part of Copenhagen County were randomly drawn from the Danish National Central Person Registry. All subjects were invited to a general health examination focusing on headache and including: a self-administered questionnaire concerning sociodemographic variables, a structured headache interview and a general physical and neurological examination. The participation rate was 76%. Information about 79% of the non-participants showed a slightly differing headache prevalence which was not quantitatively important. The following results in participants are therefore representative of the total sample. The lifetime prevalences of headache (including anybody with any form of headache), migraine, and tension-type headache were 93, 8 and 69% in men; and 99, 25 and 88% in women. The point prevalence of headache was 11% in men and 22% in women. Prevalence of migraine in the previous year was 6% in men and 15% in women and the corresponding prevalences of tension-type headache were 63 and 86%.

Differences according to sex were significant with a male: female ratio of 1:3 in migraine, and 4:5 in tension-type headache. The prevalence of tension-type headache decreased with increasing age, whereas migraine showed no correlation to age within the studied age interval. Headache disorders are extremely prevalent and represent a major health problem, which merits increased attention.

PMID: 1941010 [PubMed - indexed for MEDLINE]

Epidemiological aspects of headache in a workplace setting and the impact on the economic loss.

The objective of this study was to assess the epidemiological aspects of headache in a workplace setting and the economical impact. By sending a questionnaire to 1781 employees of a Dutch manufacturing company we tried to assess the prevalence of headache and headache subtype within this working place. Besides the personal view of each responder regarding his/her headache subtype, the International Headache Society (IHS) criteria were used to classify headaches on the basis of reported features. Moreover the missing labour days, as a result of headache, during the previous 4 weeks were measured, as well as the loss of productivity at the working place during an episode of headache; from this an estimate of the economic loss could be calculated. The response rate of the questionnaire was 60.8%. The lifetime prevalence of headache amongst the responders was 53.3%. Of these, 34.5% thought their headache was tension-type headache, 10.6% thought it was migraine, 5.4% mentioned daily headache, and 18.2% mentioned another type of headache. According to the IHS criteria the differentiation was somewhat different: 26.2% of the headache could be classified as tension-type headache and 15% as migraine. When the costs for lost labour days and loss of productivity as a result of all types of headache were accumulated, the economic loss was estimated at 18,933 US dollars in 4 weeks (for the group of responders). In conclusion, headache is related to a substantial economic loss; migraine is probably underestimated in a workplace setting.

Lost workdays and decreased work effectiveness associated with headache in the workplace.


Schwartz BS, Stewart WF, Lipton RB.

Department of Environmental Health Sciences, Johns Hopkins University, Baltimore, Md, USA.

Little is known about the impact of different types of headache on lost work time and work effectiveness in the United States. Estimation of the distribution and magnitude of the impact of headache in the workplace is necessary before workplace interventions can be developed. During 1993 and 1994 in Baltimore County, Maryland, study subjects were contacted by random-digit dialing and interviewed by telephone about their headaches. Headache diagnoses were assigned using International Headache Society criteria for migraine and episodic tension-type headache. Measures of workplace impact were derived based on self-reports of missing work because of headache and frequency and magnitude of reduced work level because of headache. Of the 13,343 respondents, 9.4% reported missing work more than rarely because of headache, 31% reported that their work level was reduced more than rarely because of headache, 31% reported that their work level was reduced more than rarely by headache, and 9.2% reported that their work level was reduced more than 50% by headaches during work. In accounting for both actual lost workdays and reduced effectiveness at work, individuals lost the equivalent of 4.2 days per year because of headache. Of the 9922 annual estimated actual lost workdays because of headache, 57% were due to migraine and 43% were due to tension-type and other headache types. Of the 23,287 annual estimated reduced effectiveness workday equivalents, 64% were due to
tension-type and other headache types, and 36% were due to migraine. Headache type, headache severity, and education level were each independent predictors of workplace impact of headache. Subjects with migraine headache were much more likely to report actual lost workdays because of headache, whereas tension-type and other headache types accounted for a large proportion of decreased work effectiveness because of headache. The results have implications regarding the control of indirect costs in the workplace because of headache, and on workplace-based treatment and prevention programs.

Physiotherapy for tension-type headache: a controlled study.


Torelli P, Jensen R, Olesen J.

Headache Centre, Unit of Neurology, Department of Neuroscience, University of Parma, Strada del Quartiere 4, 43100 Parma, Italy. paolatorelli@libero.it

The role of non-pharmacological therapies in the preventive treatment of tension-type headache (TTH) is still an object of debate. The primary aim of this study was therefore to investigate the therapeutic effect of physiotherapy in properly classified patients with TTH in a controlled trial. Fifty patients with TTH, 26 with episodic, frequent (ETTH) and 24 with chronic TTH (CTTH) fulfilling the International Headache Society classification criteria were included in the study. After a 4-week run-in period, they were randomized to either an 8-week period of standardized physiotherapy (group 1) or to an 8-week observation period followed by an identical course of physiotherapy (group 2); after the physiotherapy all patients were followed for a 12-week follow-up period. We then evaluated the number of days with headache, severity and duration of the headache attacks, and drug consumption for symptomatic treatment before and after the course of physiotherapy. Forty-eight patients completed the study. The average number of days with headache per 4-week period was reduced from 16.3 days at baseline to 12.3 days in the last 4 weeks of treatment [from 14.5 days to 10.5 days (P < 0.001) in group 1 and from 18.1 days to 14.1 days (P < 0.001) in group 2]. Severity and duration of headache as well as drug consumption were unchanged throughout the study. Analysing the response to treatment separately in the various subgroups, we found that the number of responders was significantly higher among patients with CTTH vs. patients with ETTH (P < 0.002) and in females vs. males (P < 0.02). No differences were found between patients with and without disorder of pericranial muscles. We conclude
that a standardized physiotherapy programme has a good therapeutic effect, albeit on a restricted group of patients.

The effectiveness of physiotherapy and manipulation in patients with tension-type headache: a systematic review

Marie-Louise B. Lenssinck\textsuperscript{a}, Léonie Damen\textsuperscript{a, b}, Arianne P. Verhagen\textsuperscript{a}, Marjolein Y. Berger\textsuperscript{a}, Jan Passchier\textsuperscript{b} and Bart W. Koes\textsuperscript{a}

\textsuperscript{a}Department of General Practice, Erasmus MC, University Medical Centre Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands
\textsuperscript{b}Department of Medical Psychology and Psychotherapy, Erasmus MC, University Medical Centre Rotterdam, Rotterdam, The Netherlands

Received 31 March 2004; revised 29 July 2004; accepted 17 September 2004. AIB-17111. Available online 17 November 2004.

Abstract

The study design is a systematic review of randomised clinical trials (RCTs). The objectives of the present study are to assess the effectiveness of physiotherapy and (spinal) manipulation in patients with tension-type headache (TTH). No systematic review exists concerning the effectiveness of physiotherapy and (spinal) manipulation primarily focussing on TTH. Literature was searched using a computerised search of MEDLINE, EMBASE and the Cochrane library. Only RCTs including physiotherapy and/or (spinal) manipulation used in the treatment of TTH in adults were selected. Two reviewers independently assessed the methodological quality of the RCTs using the Delphi-list. A study was considered of high quality if it satisfied at least six points on the methodological quality list. Twelve publications met the inclusion criteria, including three dual or overlapping publications resulting in eight studies included. These studies showed a large variety of interventions, such as chiropractic spinal manipulation, connective tissue manipulation or physiotherapy. Only two studies were considered to be of high quality, but showed inconsistent results. Because of clinical heterogeneity and poor methodological quality in many studies, it appeared to be not possible to draw valid conclusions. Therefore, we conclude that there is insufficient evidence to either support or refute the effectiveness of physiotherapy and (spinal) manipulation in patients with TTH.

Keywords: Physiotherapy; (Spinal) Manipulation; Effectiveness; Tension-type headache; Randomised clinical trial; Systematic review