

The Craniomandibular Dysfunction (CMD) –a frequently overlooked disorder in the treatment of unspecific back pain

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Abstract

Introduction:

Neuromuscular reflexes create direct links between the cranio-mandibular and the cranio-cervical region. As a result, a malposition of the jaw (CMD) invariably causes a malposition in the upper cervical spine (CCD = cranio-cervical dysfunction) and vice versa. Unless CCD and CMD are treated simultaneously by manual therapists and the dentist, patients often suffer from therapy-resistant, causally unexplainable unspecific complaints such as headaches, neck, shoulder and back pain. This study looked at unspecific back pain of 555 patients with cranio-mandibular (CMD) and cranio-cervical (CCD) dysfunction. 404 (73%) of the 555 CMD/CCD patients complained of therapy-resistant unspecific back pain.

Group of patients: This study is based on the author's patient data between 1999 and 2007; 404 CMD/CCD patients with chronic pain were examined and questioned with respect to functional

spine syndromes and unspecific back pain before and after a combined and simultaneous dental and manual-medical treatment of their CMD/CCD. The group consists of 132 men (33%) and 272 women (76%) aged 43 years on average (the youngest was 12, the oldest 74 years old). On average, patients were followed for 31 months. On a range between 1 and 10, average pain was qualified as 7. In 97% (n= 391), the complaints existed for over 6 months. In addition to back pain, 92% complained of neck pain, 39% of hip pain, 38% of knee pain and 43% of dizziness. 67% of the patients had widespread body pain.

Therapeutic approach:

The CMD was treated via a neuromuscular and myocentrically positioned oral orthosis (splint). The splint therapy was supported by simultaneous manual therapy of the functional spine syndrome. The preparation of the splint and the determination of the myocentric jaw position were based on the

neuromuscular aspects according to Jankelson. As prerequisite for determining the position of the jaw, the masticatory, head and neck muscles had to be relaxed. Muscle tension was measured electromyographically before the beginning of the treatment and after the relaxation measures prior to taking the impressions for the splint. Relaxation was achieved via manual therapy combined with low frequency TENS therapy of the masticatory muscles. These measures were again applied directly before adjusting and grinding the splint. The quality of the occlusal function was checked via manual-medical tests (leg length, hip abduction). The patients wore the splint constantly, including during meals, in order to stabilize the cybernetic unity formed by the temporomandibular and the atlantal joint. The correct position of the splint was monitored in conjunction with manual therapy in order to improve the dysfunction of the skeletal and supporting structures.

Results:

The unspecific back pain of 84% of the previously therapy-resistant patients were reported to be improved to a large or very large extent. As a result, the previously unspecific back pain became specific since it could be causally explained by a CCM/CCD. Neck, hip, knee pain, headache and dizziness were reported to be improved by >80% of subjects.

Conclusion:

In many cases, any attempt to treat chronic spine-related pain is almost certainly bound to fail unless a malposition of the jaw (CMD) is taken into account as well. Or, in the words of the German Pain Association: "People who fight pain need strong allies."

Introduction:

This study represents a very different kind of evidence basing: Not a highly complex and obscurely financed study, but a survey among the subscribers of the largest US consumer magazine - Consumer Reports 1. It focused on a problem

most of us have already had or will experience at some point, which is back pain.

Eighty percent of the survey participants suffered or still suffer from back pain. A more in-depth survey was performed among 14,000 subscribers, who had suffered back pain in the previous year. It first looked into where the patients found greatest relief. Asked, who could greatly improve or remove back pain by hands-on support and advice, the following percentages of survey participants pointed to their:

Chiropractor	59%
Physiotherapist	55%
Acupuncturist	53%
Orthopedist	44%
General practitioner	43%

These results suggest a number of things:

1. There seems to be a large number of unreported cases - almost half of the patients suffering from back pain - that cannot be adequately treated.
2. The disciplines that provided the best relief are by no means those that require the longest university training. In this context, we must remember that licenses in the US healthcare system are granted on different grounds than in Germany: According to the U. S. Department of Labor (<http://www.bls.gov/oco/ocos071.htm>), a chiropractor must train for 2-4 years in college and another 4 years in a chiropractic college. From this, he/she typically graduates as a "Doctor of Chiropractic (D.C.)". Physiotherapists also undergo a different training in the US. After a general bachelor, candidates enroll in a specific training course at an accredited school of physiotherapy and graduate after 2-2.5 years as a Master or after 3 years as a Doctor of Physiotherapy. Orthopedists, on the other hand, must attend 4 years of college, graduate as a bachelor, study for 4 year at a medical school and spend another 5 years as a surgical resident with a

focus on orthopedic surgery at a university. General practitioners must study medicine (see above) and work for 3 years as a medical resident at a university.

3. Statistical evidence suggests that disciplines barred from invasive treatment have better success in treating back pain. Naturally, a medical specialist can also use non-invasive methods or refer the patient to an appropriate therapist. Since the survey focused not only on the success of the therapy but also on the advice given to patients, one might assume that the most qualified specialists would also have the highest success rates because they have the broadest range of invasive and non-invasive methods at their disposal. Still, it seems that they don't use non-invasive therapies.

If we bear this in mind, the other findings of this broad-based study are not surprising:

- Treatment by medical specialist is often invasive.
- Unintended side-effects from these invasive treatments by medical specialists are more frequent than from non-invasive treatment.

In addition, about 50% of the patients suffering from back pain, who were treated with prescription drugs, were given opioid-type painkillers that caused disagreeable side-effects in about half of the patients.

What is true for 14,000 people likely holds true for others: back pain is very obviously a common problem that leaves many questions unanswered. The following retrospective praxis study is looking into this topic. 404 CMD/CCD patients with chronic pain were examined and questioned with respect to functional spine syndromes and unspecific back pain before and after a combined and simultaneous dental and manual-medical treatment of their CMD/CCD. By including CMD in the therapeutic concept, pain could be relieved in a large number of previously therapy-resistant patients.

Neuromuscular reflexes create direct links between the craniomandibular and the cranio-cervical region. Hülse, Neuhuber, Wolff, Zafar and others have studied and described the correlation between temporomandibular joint and upper cervical spine (*fig. 1*).^{2,3,6,7} As a result, a malposition of

Correlation between temporomandibular joint and upper cervical spine

The temporomandibular joint and the upper cervical spine form a reflex unit under neuromuscular and neurophysiological control.

The movements of the upper cervical spine and the temporomandibular joints are coordinated by joint motor programmes via descending corticobulbal or corticospinal pathways. Jaw and head movements are always coordinated.



From:
Neuhuber, ICCMO Compendium, 2004

A malposition of the jaw cannot be separated from a malposition of the cervical spine.

Dysfunctions of the upper cervical spine and the temporomandibular joints impact the postural muscles all the way down to the lower extremities.

Figure 1: Correlation between temporomandibular joint and upper cervical spine⁵

the jaw (CMD) invariably causes a malposition in the upper cervical spine (CCD = craniocervical dysfunction) and vice versa.³ A study of Losert-Bruggner is based on the examinations of 553 CMD patients and confirms also the cybernetic relationship between the temporomandibular and the body periphery. 545 of these patients with a pathological occlusion had a leg length discrepancy. Decoupling the occlusion by way of an Aqualizer lead to a physiological occlusion and the leg length discrepancy of all the patients disappeared (*fig. 2a*). On average, the patients showed an initial 45 degree deficit in hip mobility. After walking with the Aqualizer, the mobility deficit of the hip could be reduced by more than half to 20 degrees (*fig. 2b*).^{4,8}

Unless CCD and CMD are treated simultaneously by manual therapists and the dentist, patients often suffer from therapy-resistant, causally unexplainable unspecific complaints such as headaches, neck, shoulder and back pain. This study looked at unspecific back pain of 555 patients with craniomandibular (CMD) and cranio-cervical (CCD) dysfunction. 404 (73%) of the 555 CMD/CCD patients complained about therapy-resistant unspecific back pain.

Materials and Methods

Study Population

This study is based on Losert-Bruggner's patient data between 1999 and 2007, 404 CMD/CCD patients with chronic pain were examined and

questioned with respect to functional spine syndromes and unspecific back pain before and after a combined and simultaneous dental and manual-medical treatment of their CMD/CCD. The group consists of 132 men (33%) and 272 women (76%) aged 43 years on average (the youngest was 12, the oldest 74 years old). On average, patients were followed for 31 months. On a range between 1 and 10, average pain was qualified as 7. In 97% (n= 391), the complaints existed for over 6 months. In addition to back pain, 92% complained of neck pain, 39% of hip pain, 38% of knee pain and 43% of dizziness. 67% suffered from widespread body pain (pain in 3 and 4 body quadrants).

Therapeutic Approach

The CMD was treated via a neuromuscular and myocentrically positioned oral orthosis (splint). The splint therapy was supported by simultaneous manual therapy of the functional spine syndrome. The preparation of the splint and the determination of the myocentric jaw position were based on the neuromuscular aspects according to the protocol of B. Jankelson. As a prerequisite for determining the position of the jaw, the mastication, head and neck muscles had to be relaxed. Muscle tension was measured electromyographically before the beginning of the treatment and after the relaxation measures prior to obtaining a bite registration for the fabrication of the splint. Relaxation was

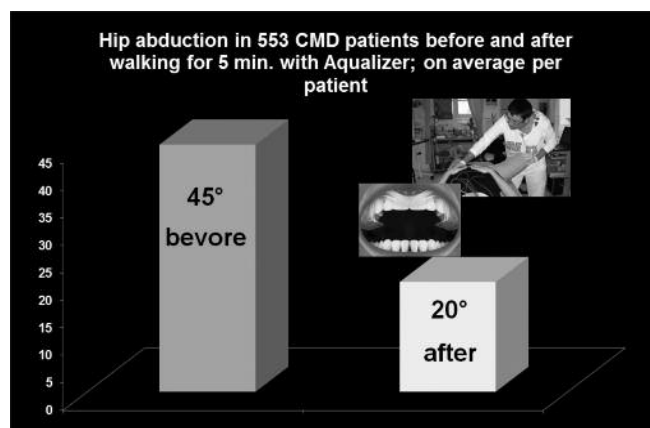
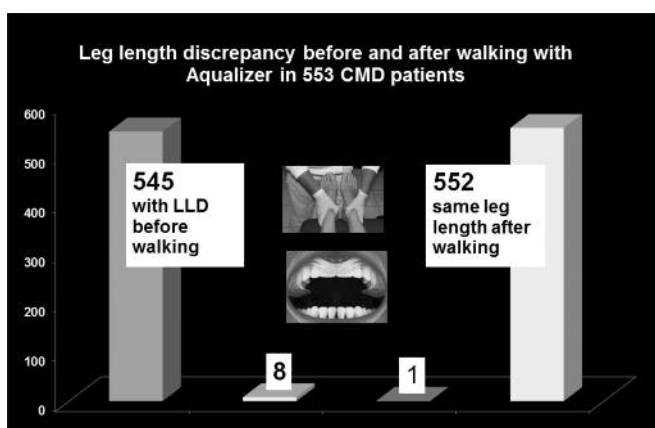


Figure 2a, b: Relationship between jaw position and body periphery.

achieved via manual therapy combined with low frequency TENS therapy of the mastication muscles. These measures were again applied directly before adjusting and grinding the splint. The quality of the myocentric bite registration was checked via manual-medical tests (leg length, hip abduction). The patients wore the splint constantly, including during meals, in order to stabilize the cybernetic unity formed by the temporomandibular and the upper cervical spine. The correct position of the splint was adjusted and monitored in conjunction with manual therapy in order to improve the dysfunction of the skeletal and supporting structures.

Results:

The unspecific back pain of 84% of the previously therapy-resistant patients could be improved to a large or very large extent. As a result, the previously unspecific back pain became specific since it could be causally explained by a CCM/CCD. Neck, hip, knee pain, headache and dizziness could be improved by >80%.

Discussion:

The therapy of craniomandibular dysfunction (CMD) has substantially gained in importance over the past years either because these dysfunctions have indeed increased in the modern world or because therapists have become more clairvoyant in the last years and are detecting these problems and their importance for the patients' health earlier and more frequently. Looking into the pain situation becomes even more complex if additional dysfunctions of the cervical spine and the spine in general are involved. Through neuromuscular reflexes, they lead almost always to CMD and CMD almost always causes pronounced dysfunctions of the supporting structures. These dysfunctions lead not only to pain which can be ostensibly related to a CMD but also to multiple body complaints such as headaches, neck, hip, knee and back pain, dizziness, heart complaints, voice disor-

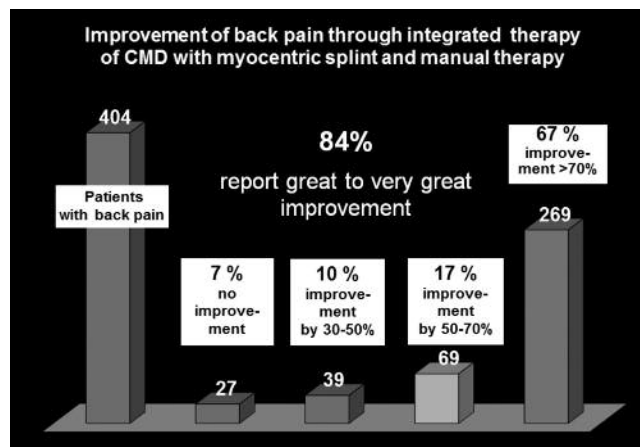


Figure 3: Improvement of unspecific back pain through simultaneous and combined therapy by manual therapist and dentist.

ders etc. that are usually not causally related to a CMD. If this relationship remains undetected patients typically develop therapy-resistant pain, which leads to high costs for the society. According to the 2006 health report of the German government, 70% of the population suffer from headaches and 60% from back pain. The overall costs for treatment, rehabilitation and early retirement of back pain patients are quantified at 25 billion euro annually, which corresponds to 10% of government spending in the federal budget 2005.

85% of this back pain is qualified as unspecific, which means that the cause of this pain could not be ascertained. The North American Spine Society, the German Society for the Study of Pain and the Pharmaceutical Association of the German Medical Doctors recommendations for the treatment of unspecific back pain (NSRS) include no more than 1 to 2 days in bed, early mobilization and activation, postural and mobility training, therapeutic exercises, physiotherapy and psychotherapeutic advisory. However, these associations do not recommend testing or accounting for CMD. This position is even more questionable as illustrated in Table 1, which shows that an interdisciplinary, neuromuscularly focused splint therapy and cooperation between orthopedist, manual

therapist and dentist can substantially improve the complaints of most patients with back pain.

Conclusion:

In many cases, any attempt to treat chronic spine-related pain is almost certainly bound to fail unless a malposition of the jaw (CMD) is recognized and successfully treated. Or, in the words of the German Society for the Study of Pain: "People who fight pain need strong allies." A pertinent truth! Still, our research efforts on pain should focus more on the causes of pain and not so much on its symptoms.

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Symptoms of 404 CMD patients with back pain	Absolute number	Number in %	Absolute number of improvement	Improvement in %
Neck pain	370	92	309	83
Hip pain	158	39	126	80
Knee pain	152	38	129	85
Headache	273	68	226	82
Dizziness	173	43	115	85

Table 1: Improvement of unspecific pain and complaints through simultaneous and combined therapy by manual therapist and dentist.