A Case Study of Tension Headache and Neck Pain

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INTRODUCTION

Chronic headache is a significant medical and socio-economic problem which results in severe disability and impairment (Chou, & Lenrow, 2002) and appears in more than half of all physician visits. (Dobritt, 2006) It is estimated 80% of all headaches are tension related, i.e., arising from muscle contraction. (Lichten, 2006)

A variety of muscles of the head, neck and upper thoracic may be involved. Patients who suffer from muscle tension headaches usually complain of continuous, dull, deep, non-throbbing ache, tightness or pressure sensation in the cervical, occipital, frontal or temporal areas. Symptoms are unilateral in approximately half of the patients and bilateral or changing in the remainder. (Dobritt, 2006)

Chinese Medicine (CM) has a long tradition of headache treatment. Acupuncture, acupressure and guasha technique are all well suited to dealing directly with the associated musculo-skeletal contractions. But in addition, CM has the ability to apply non-local (i.e., distal) treatment protocols which are highly effective in their own right and even more so when combined with local treatment.

This paper presents a case study which emphasises the importance of treating the whole person. This may involve taking into account general factors such as mental and emotional predisposition and occupational body use as well as the specific patterns of musculo-skeletal tension throughout the whole body.

LITERATURE REVIEW

Western Scientific Perspective

The exact pathophysiology for tension headache is not well understood. At the simplest level tension headache involves spasming of selected cervical and/or cranial muscles. Various authors have proposed a range of theories for the subsequent pain levels, from neurophysiologic basis involving ascending fibres from the C1 and C2 nerve roots to multiple pain generators in pain-sensitive structures involved in head movement. (Chou & Lenrow, 2002) Ischemia may also be involved.

Numerous RCT’s and systematic reviews have evaluated the clinical efficacy of acupuncture for treatment of tension headache, however in many instances the results are inconclusive. This is partly because “...clinical research on acupuncture poses unique methodologic challenges.” (Kaptchuk, 2002) One thing that has been widely accepted for many years is that “...there seems to be a clear, but variable influence of stress in the various types of headache. The negative influence of stress is probably most apparent in the acute form of tension headache.” (Sjaastad, 1987)
A 2000 review of 27 clinical trials evaluating the efficacy of acupuncture in the treatment of primary headaches found that 23 of the trials supported the efficacy of acupuncture for treatment of headache. Despite this positive finding, the authors stressed the difficulties of evaluating acupuncture. (Manias, Tagaris, & Karageorgiou, 2000) Other studies confirm the likely efficacy of acupuncture treatment but provide little relevant additional information on long-term effects, prognostic factors, and adverse effects. (Linde, Scholz, Melchart, & Willich, 2002; Nabet, & Kawakita, 2002; Inrich et. al., 2001) A 2001 review of 26 trials involving 1151 patients concluded: “... 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. (Melchart et. al., 2001)

Other studies are more forthright in declaring “... acupuncture treatment of headache leads to persisting, clinically relevant benefits for primary care patients with chronic headache.” (Vickers et. al., 2004) A 2005 study conducted by the University of Oslo examined the effect of acupuncture treatment on 24 female office workers with chronic neck and shoulder pain. It found pain-related activity impairment at work was significantly less in the test group than the controls by the end of treatment (P < 0.04a and there were significant differences between the groups for quality of sleep, anxiety, depression and satisfaction with life (P < 0.05). At six months and three years follow ups the acupuncture group showed further improvements in most variables and was again significantly different from the control group. (He, Hostmark, Veiersted & Medbo, 2005)

Much scientific research is focused on the neurophysiological basis of acupuncture. (Soh, 2005) Other research has shown that acupuncture activates endogenous opioid mechanisms (endorphin production). Recent data, obtained by using functional magnetic resonance imaging, suggest that acupuncture has regionally specific, quantifiable effects on relevant brain structures. Acupuncture may stimulate gene expression of neuropeptides. (Kaptchuk, 2002) Helene Langevin hypothesises acupuncture meridians correlate with the network of interstitial connective tissue, which has a bearing on acupuncture’s therapeutic mechanism. (Langevin & Yandow, 2002)

**Chinese Medicine Perspective**

CM regards the head as the area of the highest potential in the circulation of Qi in the channels and therefore “... intrinsically prone to rising of energy (or pathogenic factors) to the top.” (Maciocia, 1994, page 6). Maciocia quotes Zhang Jie Bin in the Classic of Categories saying that all headaches are simply due to either too much or too little Qi in the head. (op. cit., page 12) Headache arising from too much Qi are regarded as Excess; those deriving from too little Qi reflect Deficiency.
CM protocols for tension headache treatment are well established and included in all major CM texts. (Wiseman, & Ellis, 1996; Maciocia, 1994; Ellis, Wiseman & Boss, 1991; Cheng, 1987; Kaptchuk, 1983; Bensky, & O’Connor, 1981; Essentials of Chinese Acupuncture 1980) Initial diagnosis determines whether the condition is arising from invasion of an Exterior Pathogen, namely: Wind-Cold, Wind-Heat or Wind-Dampness. In the absence of Exterior signs, headache is regarded as an Internal condition and will generally present as a combination of Excess and Deficiency.

One or more of these Deficiencies is regarded as the primary pattern of disharmony, with a corresponding Excess regarded as the supplementary pattern. For example, a Deficiency of Kidney Yin (a deficient condition) may lead to Hyperactive Liver Yang (an excess condition). Together these patterns form the Root of the disharmony, whereas the symptoms (neck tension and headache) are regarded as the Branch. Effective treatment usually involves combined treatment of the Root and the Branch, though either of these may be given emphasis or priority.

The primary Deficiencies and common Excesses are summarised in Table 1:

**Primary Deficiencies:**
- Deficient Qi
- Deficient Blood
- Deficient Kidney Yin
- Deficient Kidney Yang

**Common Excesses:**
- Stagnant Liver Qi
- Blood Stasis
- Liver Fire
- Hyperactive Liver Yang
- Phlegm

*Table 1: Patterns of Deficiency and Excess in Tension Headache*

### CASE PRESENTATION

**Presenting symptoms**

Patricia, a 32 year old woman, presented with a severe episode of a recurring tension headache, manifesting as a constant and severe tightness in the temples, predominantly on the right, and often centrally at the brow. Her headache recurred two or three times a week and was associated with acute pain and tension in her neck and shoulders.
Relevant health history
Motor vehicle accident two years prior. Patricia had suffered a whiplash injury to the neck after being hit both from behind and from the side.

Associated conditions and general health
Lower back pain with associated sensation of pins and needles in her right leg. Painful menses with heavy bleeding lasting seven days. Patricia was currently taking antibiotics for a throat infection.

Findings on examination
Pulse
Thin and slightly rapid; deficient in the Guan and Chi positions of the left wrist.

Tongue
Swollen with a yellow coat and bright red tip and sides.

Abdomen
Extremely sensitive and tender throughout the abdomen, especially in the lower lateral region and anterior hips.

Previous Treatment
Patricia had been receiving regular treatments throughout the past two years including physiotherapy, acupuncture and remedial massage.

DIAGNOSIS AND PATHOGENESIS

Western Scientific Perspective
Muscle contraction leading to headache can arise from both psychological and physical factors. The former includes the full range of mental/emotional conditions in response to stress, depression or anxiety; the latter includes inefficient posture, repetitive activity or trauma. Any activity that causes the head to be held in one position for a long time without moving, such as computer work, can cause a headache. Motor vehicle accidents are a common underlying factor in chronic tension headaches. Other causes include eye strain, fatigue, alcohol use, excessive smoking, excessive caffeine use, sinus infection, nasal congestion, overexertion, colds, and influenza. (US National Library of Medicine, 2006)

It is common for head and neck pain to originate from spasming of the cervical musculature. Tension headaches are the result of sustained muscle contraction which produces both irritation at muscle insertion points and ischemic pain of the muscle itself. Loss of function and pain can also arise from prolonged and continuous pressure on cervical and cranial nerves due to a reduction in the spaces through which nerves pass. The sites of nerve compression in the neck are the intervertebral foramina, the spinal canal, the interscalene
space and the course of the occipital nerves through the trapezius muscle at the base of the skull. Impairment of free movement at the joints, discs or ligaments may lead to irritation of sensitive structures of the joints and soft tissue of the neck. Reflex muscle spasms resulting from this irritation can produce continuous tension on the periosteal insertion of muscles. (Dobritt, 2006)

Irritation of the cervical nerve roots at any point from their origin to the occipital muscles can result in pain referred to the head and neck. Common sources of such irritation are the degenerative changes associated with osteophytes. As the degenerative process progresses, the spinal canal decreases in all diameters causing pressure on the long ascending and descending tracts as well as the cervical nerve roots. The most frequent complaint of the patient with cervical spondylosis is cervical, occipital or atypical facial pain due to irritation of the C2, C3 and C4 nerve roots. The continued irritation of these roots as they exit from the intervertebral foramina produce an inflammatory response in the root with secondary edema. (op. cit., 2006)

**Chinese Medicine Perspective**

Patricia’s presentation involved a mixed pattern of Deficiency and Excess. Pulse diagnosis revealed a fundamental **Deficiency of Kidney and Liver Yin** with a corresponding **Hyperactivity of Liver Yang**, manifesting as pain in the Gall Bladder region of the head (temples) and dizziness.

Her abdominal hypersensitivity and tenderness revealed a **Stagnation of Liver Qi** in the Lower Jiao and the yellow tongue coat revealed **Stomach Heat** manifesting as the recent throat infection and pain in the forehead. (Maciocia, 1994, page 9).

The bright red sides of Patricia’s tongue revealed **Liver Fire**. Similar to and broadly overlapping a diagnosis of Hyperactive Liver Yang, Liver Fire can also manifest as temporal headache but includes widespread inflammation and tenderness of the entire upper back and flanks. Although Liver Fire is normally regarded as a pure Excess condition, both of these patterns are based on a Deficiency of Liver Yin.

The correspondences of these signs and symptoms are summarised in Table. 2.
<table>
<thead>
<tr>
<th>Sign</th>
<th>Indication</th>
</tr>
</thead>
<tbody>
<tr>
<td>deficient pulse in Guan and</td>
<td>Deficient Kidney and Liver Yin</td>
</tr>
<tr>
<td>Chi positions of left wrist</td>
<td></td>
</tr>
<tr>
<td>thin pulse</td>
<td>Obstruction of Qi and Blood</td>
</tr>
<tr>
<td>slightly rapid pulse</td>
<td>Heat</td>
</tr>
<tr>
<td>temporal headache</td>
<td>Hyperactive Liver Yang</td>
</tr>
<tr>
<td>dizziness</td>
<td>Hyperactive Liver Yang/Stirring of Liver Wind</td>
</tr>
<tr>
<td>frontal headache</td>
<td>Heat in Stomach</td>
</tr>
<tr>
<td>yellow tongue coat</td>
<td>Heat in Stomach</td>
</tr>
<tr>
<td>bright red sides of tongue</td>
<td>Liver Fire</td>
</tr>
<tr>
<td>stiff neck</td>
<td>Stirring of Liver Wind</td>
</tr>
<tr>
<td>throat infection</td>
<td>Heat in Stomach</td>
</tr>
<tr>
<td>tenderness and hypersensitivity in lower abdomen</td>
<td>Liver Q i Stagnation</td>
</tr>
<tr>
<td>and anterior hip</td>
<td></td>
</tr>
<tr>
<td>severe menstrual pain with</td>
<td>Liver Q i Stagnation</td>
</tr>
<tr>
<td>prolonged heavy bleeding</td>
<td></td>
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</tbody>
</table>

**Table 2: Analysis of Signs and Symptoms**

**TREATMENT AND MANAGEMENT**

**Treatment Principle**

Tonify Kidney and Liver Yin; Subdue Liver Yang and Wind; Disperse Stagnation of Qi in the Lower Jiao; Disperse Liver Fire.

**Palpation**

Abdominal palpation revealed extreme sensitivity in the lower lateral abdomen and the anterior and lateral hips. In the experience of this author, this is the predominant region where Stagnant Liver Qi manifests. A quick check established a difference in leg lengths measured at the lateral malleolus of 1.5 cm with a corresponding difference in height of the anterior hips. This confirmed a high degree of mechanical tension in the pelvis.

Initial palpation rapidly evolved to acupressure. Firm sustained pressure was applied to the lower lateral abdomen with flat fingertips and to the anterior hip with the thumbs. Hand friction was then applied to the iliotibial band with a Chinese liniment to rapidly stimulate the flow of blood in the Gall Bladder channel. This protocol was delivered for approximately ten minutes.

**Acupuncture Treatment**

Needles were applied as described in Table 3. (1)

(1) It should be noted that these needles were applied with great “body” reluctance on behalf of the patient. Although Patricia was consciously willing to receive this treatment, her high degree of abdominal tension generated a natural instinct to defend against the needle insertion. In particular her hands were continually pushing against the practitioners hands. Because of this, permission to proceed was sought and received twice throughout this procedure with the patient expressing trust in the process.
Root Treatment
Kid 10 and Liv 8 40 mm x 0.16 mm needle gentle, shallow, brief insertion

Distal needles
Liv 3 40 mm x 0.25 mm needle even technique
GB 41 40 mm x 0.25 mm needle dispersive technique

Local needles
three ashi points on the anterior hips, in the inguinal canal, inferior to the anterior superior iliac spine. 40 mm x 0.30 mm needles deep insertion, dispersive
GB 27 75 mm x 0.30 mm needle long, lateral insertion directed inferiorly

Complementary Needles
CV 4 40 mm x 0.25 mm needle even insertion
CV 17 40 mm x 0.25 mm needle even insertion
LI 10 40 mm x 0.25 mm needle even insertion

Table 3: Acupuncture Treatment

Forearms
Hand friction was then applied to the extensor muscles of the forearms with a Chinese liniment, to stimulate Qi and Blood and to further disperse tension. LI 10 was then needled.

Kid 10, Liv 8 Tonifies Kidney and Liver Yin; this process generates an increase in Qi and Blood in the Liver channel and therefore provides better conditions for the subsequent re-direction of Qi undertaken throughout the subsequent treatment procedures
Liver 3 Spreads Liver Qi; subdues Liver Yang and extinguishes Wind; tonifies Liver Yin; regulates the lower jiao
Gall Bladder 41 Spreads Liver Qi; clears Fire and extinguishes Wind; courses Liver Qi stagnation
Anterior hip reduces muscle spasm; disperses Liver Qi stagnation
Gall Bladder 27 regulates the lower jiao and transforms stagnation
CV 4 fortifies original Qi and benefits essence; tonifies and nourishes the Kidney; regulates the lower Jiao
CV 17 regulates Qi and promotes the downward movement of Qi
LI 10 Regulates qi and blood, activates the channel and alleviates pain
Sliding Cup Guasha disperses Liver Fire; disperses stagnant Qi and Blood

Table 4: Treatment Rationale
Guasha

Finally, a sliding cup Guasha was applied to the upper back, directed at the inner and outer Bladder channels, the Governor Vessel and the scapula. A vivid rash (Sha) was produced.

Treatment Outcomes

This patient has only been seen once and therefore no definitive conclusions can be drawn about the long term benefits of this treatment. However, at the conclusion of this treatment Patricia was completely free of headache; she felt elation and profound relief.

Ten days after this initial treatment, Patricia reported having had a single mild episode of head tension, no more low back pain and no dizziness.

DISCUSSION AND CONCLUSION

The common biomedical response to neck tension is to focus exclusively on the neck. A typical physiotherapy treatment might include ultrasound, mobilisation, application of heat to the neck or spinal adjustment. All of these could be effective techniques in certain cases.

In contrast, Traditional Chinese Medicine places localised tension in a broader context. Headache and neck pain are regarded as superficial symptoms; their treatment includes attention to their underlying causes. This has two aspects: the first, in the language of Chinese Medicine, is the pattern of disharmony; the second is the structural or mechanical pattern of tension.

With regard to the structural aspects of the tension pattern, the neck can be regarded as the culmination of the entire spine. Effective treatment for neck tension can therefore be directed to the pelvic girdle, being the support for the lower spine and fundamental to the structural integrity of the entire spine.

The need for such an approach was emphasised in this case by the inclusion of low back pain with tingling in the right leg as part of the presentation of symptoms. The dramatic success of this treatment, undertaken with no contact to the neck whatsoever, suggests that a purely localised approach may have been ineffective. It is worth noting that the author would normally have completed this treatment with massage and or shiatsu plus needles applied to the back and neck; this was only omitted due to practical time constraints. Serendipitously, this gave rise to a vivid example of a completely distal treatment, underlining the significance of the whole spine relationship.

This case can make a positive contribution to standard protocols for the acupuncture treatment of tension headaches. It is recommended that assessment is made of relative levels of tension in the anterior pelvis and lower back in all cases of tension headache.
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