Chiropractic Headache Management: Approaching a Mainstream Alternative

FCER Teleconference Series
Translating Research Into Practice
April 28, 2005
OUTLINE OF PRESENTATION

1. Cervicogenic and tension-type headache.
2. Connective tissue bridges: Mechanism.
4. Whiplash:
   a. Old wives’ tales and redefinition.
   b. Outcomes.
5. Repetitive stress/carpal tunnel disorders.
RESPONSES OF TENSION-TYPE HEADACHE TO MANIPULATION OR MEDICATION

A. Average pain intensity:

B. Weekly headache frequency:

C. Average weekly over-the-counter medication intake:

TREATMENT OF TENSION-TYPE HEADACHE

Figure 2.—Results of primary outcome measures. No difference was observed between groups for any measure. Intervention in weeks 3 to 6 indicated by shaded areas. Error bars equal 1 SE.

CERVICOGENIC HEADACHE: Trend Toward Improvement with SMT

DISTINCTION OF TENSION-TYPE AND CERVICOGENIC HEADACHES

Fig 1. The change in the number of hours a participant had a headache per day and the intensity per episode from before to after the trial. Although the responses of the control groups were similar, the cervicogenic headache group that received spinal manipulation differed significantly from the tension-type headache group (mean ± 1 standard error of measure). P values were calculated with the Mann-Whitney test. *P = .04. **P = .004.

CERVICOGENIC HEADACHE: RESPONSE TO EXERCISE, MANIPULATION¹

1. 200 cervicogenic headache participants randomized into 4 groups:
   a. Manipulative therapy: Maitland low- and high-velocity protocol.²
   b. Exercise therapy: Low-load endurance to train muscles of cervicoscapular area.
   c. Combined therapy.
   d. Control:

2. Outcomes [Post-treatment, 3 months, 6 months, 12 months]:
   a. Frequency.
   b. Intensity [VAS].
   c. Duration [hours].
   d. Neck pain [Northwick Park Neck Pain Questionnaire].

3. Results:
   a. Each active intervention showed significant reduction in all measures.
   b. Combined therapies not significantly superior to either therapy alone, but 10% more patients gained relief with the combination.
   c. Effect sizes were moderate and clinically relevant.

CERVICOGENIC HEADACHE: RESPONSE TO EXERCISE, MANIPULATION

CHIROPRACTIC TREATMENT OF CERVICOGENIC HEADACHE

1. **Patients and Setting**: 105 patients over 16 years of age, fulfilling the IHS criteria for cervicogenic headache and suffering this for over 6 months. Treated at Philip Chiropractic Research Centre, RMIT, Bundoora Campus, Melbourne, Australia.

2. **Outcome Measures**: Sickness impact profile [SPI], Neck Disability Index [NDI], computerized pain drawings, diaries, pressure algometry of head and neck, cervical ROM using a goniometer.

3. **Interventions**:
   a. **TREATMENT**: 3 adjustments/week x 3 weeks = 9, consisting of an upper cervical [C₁ or C₂] toggle recoil adjustment.
   b. **PLACEBO**: 3 sham adjustments/week x 3 weeks = 9, consisting of inactivated Pettibon adjustment.

4. **Results**:
   a. **TREATMENT group** showed 30% reduction in headache frequency, 30% reduction in headache duration, 28% reduction in headache severity, 36% reduction in medication consumption, improvements in area of headache pain, NDI scores, ROM.
   b. **PLACEBO group** showed no significant improvement from baseline in 5 out of 6 outcome measures.
   c. **TREATMENT group** at 8 months and 24 months showed continued improvements in headache frequency, severity, use of medications.
   d. No side-effects or complications were reported.

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CERVICOGENIC HEADACHE CHIROPRACTIC DOSE-RESPONSE: A PILOT STUDY¹

1. 24 adults with cervicogenic headache reported to chiropractic practice [half in college outpatient clinic, half in private practice in community]:
   a. Randomly allocated to 1, 3 or 4 visits/week over 3-week period.
   b. All patient received high-velocity low amplitude spinal manipulation.
   c. D.C.s could also apply up to 2 physical modalities at each visit, including heat and soft tissue therapy.
   d. D.C.s could also recommend rehabilitative exercises, modifications of daily activities.

2. Outcomes:
   a. 100-point Modified Van Korff pain and disability scales.
   b. Headaches in last 4 weeks.

3. Results:
   a. Substantial benefit in pain relief for 9 and 12 treatments vs 3:
      1] At 4 weeks:
         a] 13.8 for 3 visits/week.
         b] 18.7 for 4 visits/week.
      2] At 12-weeks follow-up:
         a] 19.4 for 3 visits/week.
         b] 18.1 for 4 visits/week.
   b. Similar data obtained for disability.

CERVICOGENIC HEADACHE CHIROPRACTIC DOSE-RESPONSE: A PILOT STUDY

ADJUSTED MEAN PAIN SCORES

1. 127 volunteers were recruited; 83 in the treatment group [diversified SMT] and 40 in the control group [detuned interferential therapy] completed the study.

2. The 6-month trial was divided into 3 stages:
   a. 2 months baseline before treatment;
   b. 2-month treatment [maximum 16 treatments]; and
   c. 2-month followup period.

3. Outcomes measured were:
   a. Frequency.
   b. Duration.
   c. Disability.
   d. Medication use.

TREATMENT OF MIGRAINE HEADACHE

1. Significant improvements were seen in the treatment group in:

<table>
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<td>a. Frequency</td>
<td>7.3/6.9</td>
<td>7.1/4.1</td>
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<tr>
<td>b. Duration</td>
<td>22.6/19.8</td>
<td>23.3/14.8</td>
<td>&lt;.01</td>
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<tr>
<td>c. Disability</td>
<td>18.9/15.6</td>
<td>19.8/13.0</td>
<td>&lt;.05</td>
</tr>
<tr>
<td>d. Medication use</td>
<td>20.1/16.2</td>
<td>21.3/9.8</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>e. VAS scores</td>
<td>7.9/6.2</td>
<td>8.0/6.9</td>
<td>NS</td>
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</table>

2. 18 [22%] of treatment group reported >90% reduction of migraines.

3. 5 [4%] reported that migraine episodes were worse after 2-month treatment, but this was not sustained at follow-up.

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## CHIROPRACTIC TREATMENT OF PEDIATRIC HEADACHE

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<th>n</th>
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<tr>
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<td>10</td>
<td>M</td>
<td>X-ray, MP</td>
<td>Thompson, diversified</td>
</tr>
</tbody>
</table>
| Lisi⁶          | 1  | 8       | CEH                | ROM, MP                | Diversified, Modified rotary break  
|                |    |         |                    |                        | Side posture mammillary push  
|                |    |         |                    |                        | Myofasical release          |

**Legend:** CEH, cervicogenic headache; M, migraine headache; TTH, tension-type headache; U, unspecific; ROM, range of motion, AK, applied kinesiology; MP, motion palpation; SMT, spinal manipulative therapy.

¹Haney V. Chronic pediatric migraine-type headache treated by long-term inderol prior to chiropractic care: A case report. Proceedings of the National Conference on Chiropractic Pediatrics, Palm Beach, FL, October 1993, pp. 132-140.
RANDOMIZED RCTS ON ROLE OF SMT IN CHRONIC HEADACHE: EFFECT SIZE DIFFERENCES\textsuperscript{1}

SIGNIFICANCE OF DUKE TTH AND CVG HEADACHE STUDY

1. Duke is 1 of 12 research centers given the EPC trademark status by the U.S. Department of Health and Human Services.

2. The 19 member interdisciplinary panel that did the literature review is of extremely high caliber.

3. The evidence review was comprehensive, encompassing all behavioral and physical treatments for both tension-type and cervicogenic headache.

4. The systematic review was a rigorous scientific process.

5. Non-pharmacological treatments are of growing importance:
   “If effective and available...these nonpharmacologic treatments may be the first choice for most patients.”

   “Pharmacological treatments are not suitable for all patients, nor are they universally effective. Drug treatments may also produce undesired side effects.”

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LINK OF MUSCLE TENSION AND HEADACHES

1. Consecutive patients [31/39] who underwent forehead rejuvenation procedures encompassing resection of the corrugator supercilli muscle from 1989-1999 displayed total elimination or improvement of migraine headaches with improvements lasting at least 47 months.¹

2. Neck muscles have been monitored in patients with tension-type headaches, producing a distinct EMG gradient.²

PROPOSED ORIGIN OF CERVICOGENIC HEADACHE: THE UPPER CERVICAL JOINT COMPLEX

A = Connective tissue
B = Dura
C = Occipital bone
D = Rectus capitis posterior minor muscle
E = First cervical vertebra
F = First cervical nerve root

CONNECTIVE TISSUE BRIDGES BETWEEN MUSCLE AND DURA$^{1}$ IN UPPER CERVICAL SPINE

$^{1}$Hack G, Dunn G, Toh MY. The anatomist's new tools. 1998 Medical and Health Annual, Chicago, IL: Encyclopedia Britannica, 1997, pp. 16-29
PROPOSED MECHANISM OF CERVICOGENIC HEADACHE

1. A connective tissue bridge exists between the rectus capitus posterior minor muscle and the dorsal spinal dura at the atlanto-occipital junction.

2. The dura-muscular connection transmit forces from the cervical spine joint complex to the pain-sensitive dura.

3. Trauma to the upper spine could result in rectus capitis posterior minor muscular atrophic changes.

4. This proposed mechanism resulting from adverse tension in the spinal dura could further substantiate the role of spinal manipulation as a viable treatment for cervicogenic headache.

5. Further research is needed to better define the possible relationships between the dura-muscular, dura-ligamentum nuchae connections and referred headache pain.

CONNECTIVE TISSUE ATTACHMENTS TO CERVICAL SPINAL DURA MATER

1. Evaluation done in 30 cadaveric specimens, correlating with MRIs in 4:
   a. Originated from both rectus capitis posterior minor muscle [RCPM] and ligamentum nuchae [LN] in all 30 specimens:
      1] RCPM attachments originated between C1-C2.
      2] LN attachments originated between occipital bone and C1.
   b. Attachments from LN to RCPM also identified.

2. Attachments to cervical dura mater may prevent damage to the spinal cord due to puckering of the dura mater during movements [especially extension] of the occiput and upper cervical spine, generating sufficient tension to prevent anterior dural movements.2-4

3. Propose that LN attachments exercise postural control and that their tearing during whiplash contributes to head and neck pain.

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ANNUAL INCIDENCE AND COURSE OF NECK PAIN: A COHORT STUDY

1. 1100 randomly chosen Saskatchewan adults: Mail survey in September 1995 with followup at 6 and 12 months.

2. Statistics derived:
   a. Annual incidence of neck pain = 14.6%.
   b. Each year 0.6% of population develops neck pain.
   c. Annual rate of resolution of neck pain = 36.6%.
   d. Of those reporting neck pain at baseline, 22.8% report recurrent episode.
   e. Women more likely to have neck problems:
      3] Less likely to experience resolution: Incidence ratio = 0.75.
   f. Most individuals with neck pain do not experience complete resolution of their symptoms and disability, contrary to popular belief.

SHOULDER PAIN: MANIPULATION PLUS MEDICATION

1. 150 patients with shoulder symptoms and dysfunction of shoulder girdle in general practice facility in the Netherlands randomized:
   a. 71 given usual medical care: Information, oral analgesics or NSAIDS if necessary, corticosteroid injections [28%], referral to physiotherapy [23%].
   b. 79 given usual medical care as above + manipulation: High-velocity, low-amplitude manipulations, low-velocity high-amplitude mobilizations, maximum of 6 treatment sessions over 12-week period.

2. Outcomes: Patient perceived recovery, severity of main complaint, shoulder pain, shoulder disability, general health:
   a. During and end of treatment period [6 and 12 weeks].
   b. Followup [26 and 52 weeks].

3. Results:
   a. 6 weeks: No significant differences.
   b. 12 weeks: Full patient-perceived recovery: 43% manipulation group, 21% control.
   c. Followup: Similar to 12 weeks [52% vs. 35%].
   d. During intervention and followup: Consistent favoring of manipulation in severity of main complaint, shoulder pain and disability, and general health.

4. Conclusion: Spinal manipulation accelerates recovery of shoulder symptoms.

5. Uniqueness: First trial to ADD SMT to the cervicothoracic spine to usual medical care for treatment of shoulder symptoms.

RANDOMIZED, CONTROLLED TRIAL FOR NECK PAIN

1. 183 patients, 18-70 years of age, who had nonspecific neck pain for >2 weeks randomized to 6 weeks of:
   a. **Manual therapy**: Use of passive movements, specific articular mobilization techniques, coordination or stabilization techniques [HVLA spinal manipulations were NOT included]. [Mean #treatments = 6].
   b. **Physical therapy**: Exercise therapy, manual traction or stretching, massage, PT methods such as heat or interferential current [Specific manual mobilization techniques NOT included in this protocol] [Median #treatments = 9].
   c. **Continued care by general practitioner**: Advice on prognosis and self-care [including heat applications, home exercises], ergonomics, medication including paracetamol or NSAIDs [Median #treatments = 2].

2. Practitioners given free reign for 6-week period:
   a. Number of treatments up to a maximum.
   b. Performed own evaluations.
   c. Treated individual patients according to their own findings.

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RANDOMIZED, CONTROLLED TRIAL FOR NECK PAIN

Primary Outcome Results at 7 Weeks of Follow-Up

RANDOMIZED, CONTROLLED TRIAL FOR NECK PAIN

SECONDARY OUTCOMES:

1. Range of motion improved more markedly for those receiving manual care or physical therapy.
2. General health perception on the self-rated Euro Quality of Life scale showed a statistically significant difference in favor or manual therapy.
3. Absences from work were fewer for patients undergoing manual therapy.
4. Analgesic use was less for manual therapy and physical therapy patients.

CONCLUSION:

"In daily practice, manual therapy is a favorable treatment option for patients with neck pain compared with physical therapy or continued care by a general practitioner."

WHIPLASH OLD WIVES' TALES: LACK OF SCIENTIFIC BASIS

As a result of a literature critique, there is currently no scientific or epidemiologic basis for the following statements:

1. Acute whiplash injuries do not lead to chronic pain.
2. Chronic pain resulting from whiplash injuries is usually psychogenic.
3. Whiplash injuries are unlikely to result in chronic pain in countries lacking compensatory mechanisms for injury.
4. Rear-impact collisions that do not result in vehicle damage are unlikely to cause injury.
5. Whiplash trauma is biomechanically comparative with common movements of daily living.
6. Chronic pain following acute whiplash injury is caused or worsened by treatment and diagnostic testing.
7. The risk of chronic neck pain among acutely injured whiplash victims = prevalence of chronic neck pain in the general population.

1. The publications of the Quebec Task Force on Whiplash-Associated Disorders were evaluated by the authors of this report for methodologic error and bias.

2. The QTF concluded that whiplash injuries:
   a. Result in “temporary discomfort.”
   b. Are “usually self-limiting.”
   c. Have a “favorable prognosis.”
   d. Have “pain which is not harmful.”

3. Five distinct categories of methodologic errors were found:
   a. Selection bias.
   b. Information bias.
   c. Confusing and unconventional use of terminology.
   d. Unsupported conclusions/recommendations.
   e. Inappropriate generalizations from Quebec Cohort Study.

4. Although the QTF set out to clarify contentious issues in its study, its publications instead have confused the subject further.

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CHRONIC WHIPLASH AND RESPONSE TO CHIROPRACTIC MANIPULATION

1. 100 consecutive referrals for chronic whiplash were reviewed, 7 lost to follow-up.
2. 3 groups of patients compared:
   a. Group 1: Isolated neck pain associated with restricted ROM.
   b. Group 2: Neurological symptoms or signs associated with restricted ROM.
   c. Group 3: Severe neck pain, full ROM.
3. Initial symptoms, range of neck movement, focal neurological signs [involvement of specific myotomes, dermatomes, or peripheral nerves] documented:
   a. Grade A: Absent.
   b. Grade B: Nuisance.
   c. Grade C: Intrusive.
   d. Grade D: Disabling.
4. Patients underwent spinal manipulation, HVLA thrust to specific vertebral segment with mean of 19.3 treatments.
5. Results:
   a. Group 1: 72% [36/50] responded to SMT:
      1] 24% became asymptomatic.
      2] 24% improved by 2 grades.
   b. Group 2: 94% [30/32] responded to SMT:
      1] 38% became asymptomatic.
      2] 43% improved by 2 grades.
   c. Group 3: 27% [3/11] responded to SMT:
      1] 0% became asymptomatic.
      2] 9% improved by 2 grades.

MUSCLE STRENGTH IMPROVEMENT IN ACUTE WHIPLASH¹

1. Patients and Setting: 23 patients [mean age 35.8 years] with subsacute WAD, 3 days-6 weeks post-injury.

2. Outcome Measures: Muscle strength [sphygmomanometer dynamometer] during maximal effort neck flexion/extension, arm abduction/adduction, cervical range of motion [goniometer], pressure pain threshold [algometry] of upper tranpezius and sternocleidomastoid [SCM].

3. Interventions:
   a. TREATMENT: Cervical spine adjustment with no involvement of muscle work.

4. Results:
   a. CROM: Increase total head excursion from 244° to 288°.
   b. PRESSURE-PAIN THRESHOLD: Increase by 19% for SCM, 28% for trapezius.
   c. FORCE INCREASES during flexion [+16%], extension [+15%], adduction [+6%].

INCIDENCE OF CTD

1. According to the Bureau of Labor Statistics, 1996:\(^1,^2\)
   a. Cases of reported lost-time CTD:
      1981: 23,000
      1991: 223,000
   b. Proportion of all occupational illnesses attributed to CTD:
      1981: 18%
      1991: 61%

2. In 1994 there were over 38,000 separate cases of CTS with lost work-time reported, with CTS accounting for:
   a. About 50% of CTD; and
   b. 29% of all lost-time from occupational illnesses reported that year.\(^2\)

3. The annual cost of CTD estimated by Liberty Mutual Insurance Company [a major carrier of workmen’s compensation insurance]: $563,000,000.\(^1\)

CONSERVATIVE MEDICAL SYNDROME

1. Self-reported physical and mental distress decreased significantly for both groups from baseline to end of treatment, no significant differences between groups.

2. Changes in NCS and vibrometry indicated overall treatment effects from baseline to end of treatment w/o group effects.

3. Adverse medical effects were noted in 10 [22%] of medical cohort, reflecting intolerance to ibuprofen within first 2 weeks of treatment:
   a. 5 experienced intense GI symptoms, headache or nausea and had to discontinue taking medication.
   b. 5 others took ibuprofen + liquid antacid.

4. Improvements of SF-36 scores were not apparent in either group.

## SUMMARY OF LEADING CLINICAL TRIALS INVOLVING REPETITIVE STRESS DISORDERS AND SMT

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AND IN CONCLUSION . . .

“Thank you for making this day necessary.”

--Yogi Berra