

A retrospective file review to examine the possible effectiveness of Advanced Orthogonal Technique in patients with a chief complaint of headaches.

Introduction

Headache disorders is said to be among the most common disorders of the nervous system. Globally, the percentage of the adult population with an active headache disorder is 46% for headache in general, 11% for migraine, 42% for tension-type headache and 3% for chronic daily headache (1). According to the World Health Organization's (WHOs) ranking of causes of disability, headache disorders are in the 10 most disabling conditions for both genders and in the 5 most disabling for women with migraine headaches alone. Headache disorders therefore impose a recognizable burden among its sufferers and to society in general (2). Accordingly, prevention, early intervention or effective treatment strategies for headache disorders are important aspects to control cost and its burden on the individual sufferer and for society (3).

A recent systematic review of the literature by Bryans et al. (4) on the chiropractic treatment of adults with headaches found that chiropractic care, including spinal manipulative therapy (SMT), improves migraine and cervicogenic headaches but is equivocal for tension-type headaches. Bryans et al. (4) concluded that in the chiropractic care of patients with headaches, the type, frequency, dosage, and duration of treatment(s) should be based on guideline recommendations, clinical experience, and examination findings. To further contribute to evidence-informed practice in the chiropractic care of patients with headaches, we performed a retrospective file review of patients with a chief complaint of headaches attending care with the upper cervical SMT technique known as Advanced Orthogonal Technique (5).

Methods

Our study received Institutional Review Board (IRB) approval from the IRB Board of Life Chiropractic College-West (Hayward, CA, USA).

A retrospective analysis of patient files presenting with a chief complaint of headaches at a multiple-practitioner chiropractic clinic in a period of 1 year was performed. Inclusion criteria for file review was: (a) the patient presented with a chief complaint of headaches; (b) the patient underwent a diagnostic work-up including a history and physical examination to screen for co-morbidities and signs and symptoms indicative of a contraindication to chiropractic SMT; (c) the patient received consistent chiropractic care using the Advanced Orthogonal Technique and (d) the patient completed baseline and comparative outcome measures using the Headache Impact Test-6 (HIT-6) (6), the Quadruple Visual Analog Scale (QVAS) (7) and the RAND SF-36 (8) questionnaires. The file review was performed by one of the clinicians/principal investigator with data compiled and analyzed using Excel (Excel, Microsoft Corp, Redmond, WA, USA). In addition to patient demographics (i.e., age, gender), we examined the patients' response to care using the aforementioned outcomes measures. Categorical data were analyzed using descriptive statistics (i.e., frequency distributions and percentages). Baseline and comparative measures were analyzed using paired t-test (Excel, Microsoft Corp, Redmond, WA, USA)

Results

Our file review revealed 16 files satisfying our inclusion criteria for review. The gender distribution of the patients was 11 females and 5 males. Their average age was 41.87 years (median=42.5 years; age range = 19-69 years). With respect to a headache diagnosis, all were chronic sufferers (i.e., greater than 6 months duration) and received a diagnosis of migraine headaches (N=7), cervicogenic headaches (N=5) and chronic tension headaches (N=4).

With respect to the use of the HIT-6 HA questionnaire, baseline mean scoring for the cohort was 64.00 indicating that headache had a severe impact on the respondents' daily life. Comparative testing was performed, on average, of 36.63 days since initiating care and a mean number of treatments at 4.8, resulted in a decrease in the mean score of 36.63. The HIT-6 comparative measures indicate a decrease in the impact of headache on the respondents' daily life. Paired t-test analysis using Excel (Excel, Microsoft Corp) found the decrease from baseline to comparative as statistically significant ($t_{\text{calc}}=3.5$; $df=16$; $t_{\text{crit}} = 2.0$ at $p<.01$ two-tailed test).

A scoring in the QVAS is categorized as "low-intensity" pain if the score is 50 or less and "high-intensity" pain if a score of 51 or higher is obtained. The baseline mean QVAS scoring was 53.91 for our cohort with a comparative measure mean scoring of 31.04. The comparative testing was performed following 38.50 days (on average) had elapsed since initiating care with a mean number of treatments of 5.50. Our findings indicate that chiropractic care can decreased the pain intensity associated with headaches. Paired t-test analysis using Excel (Excel, Microsoft Corp) found the decrease from baseline to comparative as statistically significant ($t_{\text{calc}}=4.52$; $df=16$; $t_{\text{crit}} = 2.13$ at $p<.01$ two-tailed test).

With respect to the RAND SF-36, we examined the 8 domains of functional health status - physical functioning, role limitations due to physical functioning, role limitations due physical health, role limitations due to emotional health, energy/fatigue, emotional well being, social functioning, pain and general health. The baseline and comparative mean scoring for each domain as well as the paired t-test analysis are summarized in Table 1. Approximately 4 weeks of care (mean number of days =34.75) was provided to the patients. Our review found an increase in scoring from baseline to comparative testing with the RAND SF-36 in all

measures of functional health status. The increase was statistically significant and interpreted as an improvement in the specific functional health status examined.

Discussion

Several notable findings are revealed in our retrospective file review. To begin and to provide further context to our discussions, we performed a systematic review of the literature on publications describing the use of upper cervical technique in the chiropractic care of patients with headaches. Pubmed [1984-2012], MANTIS [1984-2012] and Index to Chiropractic Literature [1984-2012] were consulted with the search terms “chiropractic”, “headaches” and “upper cervical technique.” Inclusion criteria for our review included: (1) a primary investigation report (i.e., case reports, case series, case control, randomized, controlled trials, and survey or surveillance studies); (2) published in the English language and (3) chiropractic care specified the use of an upper cervical SMT technique.

Our systematic review found 8 articles consisting mostly of case reports (10-14), a case series (15) and two retrospective case series (16-17). The upper cervical techniques utilized were upper cervical technique as per the International Upper Cervical Chiropractic Association (10-12), Atlas Orthogonal Chiropractic (13), Blair Technique (14), the Palmer Upper Cervical Specific Technique (15), National Upper Cervical Chiropractic Association (NUCCA) Technique (16), and Toggle Recoil (17). The Advanced Orthogonal Technique utilizes spinographic/radiographic analysis consisting of a lateral view, a horizontal view (modified submentovertex projection), a frontal view (modified Towne’s projection), and an axial view (modified A-P open mouth) of the cranium and cervical spine. Rotational and translational misalignment of the atlas with respect to the skull is measured, as well as any abnormal positioning of the cervical spine. The measurements are assessed using digital analysis software,

and are used to define misalignment of the occipito-atlanto-axial complex around the z-axis, as well as misalignment of the atlanto-axial joint around the y-axis. Chiropractic SMT is performed utilizing a table-mounted percussion instrument that delivers a specific vectored, low force, low velocity impulse to the atlas vertebra based on the radiographic analysis. The patient is placed in a side-lying position the percussion instrument consists of a metal stylus is placed at the level of the atlas transverse process, approximately 1/8" above the patient's skin. A mechanical impulse is imparted to the stylus, which transmits a compressional wave through the skin towards the atlas vertebra.

To date, this is the first publication describing the use of Advanced Orthogonal Technique in the chiropractic care of patients and the most comprehensive in use of reliable and validated outcome measures. The study by Palmer and Dickhotlz (16) examined the response of 47 non-migraine patients to NUCCA care using SF-36 and VAS. Based on our review of the literature and that of Bryans et al. (4), this is the first examination of the response of patients with headaches to chiropractic care utilizing the HIT-6 questionnaire.

With on-going health reform in the United States and other countries, it is incumbent upon all healthcare providers to demonstrate clinical effectiveness in their care protocol. The use of outcome measures to determine quality, satisfaction, efficacy, and effectiveness now serve as essential elements for health care decisions at the healthcare systems level and the formulation of health policy as well as evidence-informed practice for the individual practitioners (18).

The HIT-6 was developed to measure the burden or impact of headache on a sufferer's daily life and it has been demonstrated to be highly reliable, internally consistent, accessible and clinically applicable in daily practice (6, 19). Its been claimed that few studies have compared the findings of the HIT-6 scores with other reliable and validated outcome measures (19-21).

Our study demonstrated a decrease in the burden of headache as measured by the HIT-6 with a trial of chiropractic care. This observation correlated with an improvement with pain scores as measured by the QVAS and improvement in health-related quality of life as measured by the RAND SF-36. Furthermore, our study demonstrated that the HIT-6 questionnaire can be useful for assessing headache-related disability within a multiple-practitioner chiropractic practice given its simplicity and ease of use (22).

According to Gatterman (23), chiropractic practice is characterized by a patient-centered paradigm incorporating the principles of vitalism, holism, humanism, conservatism, naturalism, and rationalism. Others have claimed chiropractic to be a “wellness” profession (24). Inherent in these characterizations are the core concepts that physical functioning, mental and emotional well-being, social and role functioning, self-perceptions of general health, pain, energy, and vitality will improve with chiropractic care (9). The RAND SF-36 questionnaire is one of a variety of methods to measure functional health status as described above. The questionnaire has been demonstrated to be reliable and valid (25) and has been implemented in chiropractic (26-29). Similar to the HIT-6, the RAND SF-36 is characterized by its simplicity, ease of use and usefulness to acquire data on a patient’s perceived health-related quality of life. Our study demonstrated an improvement in our subjects in all RAND SF-36 domains of functional health status following a trial of chiropractic care. This was observed to be concomitant with a decrease in the negative impact of headache as measured by HIT-6 and headache pain intensity decrease as measured by QVAS. Visual analog scales to measure pain have been shown to be reliable and valid (30-31).

Despite the possible effectiveness of chiropractic care using Advanced Orthogonal Technique in patients with headache, we caution the reader and acknowledge the limitations of

our study. Inherent in all retrospective studies, significant bias exists (i.e., selection bias and misclassification bias). Furthermore, as with all retrospective studies, we relied heavily on good record keeping. No assurances can be made that this was maintained at all times throughout the care of the patients. Despite these limitations, our retrospective study demonstrated the advantage of performing retrospective studies. In addition to its cost effectiveness, we were able to measure the effects of chiropractic care in patients with headaches using multiple validated outcomes measures (32).

Conclusion

Our retrospective file review demonstrated the possible effectiveness of Advanced Orthogonal Technique in addressing patients with a chief complaint of headaches as measured by the HIT-6, QVAS and RAND SF-36 questionnaires. We encourage continued research with this technique utilizing a prospective cohort design or in a randomized controlled clinical trial.

| Domain | Mean (Baseline) | Mean (Comparative) | Normative Values (9) | Δ (Comparative- Baseline Scoring) | t_{cal} | t_{crit} |
|---|--------------------|-----------------------|-------------------------|---|-----------|------------|
| Physical functioning | 66.25 | 79.06 | 84.2 | 12.81 | -2.43 | 2.13 |
| Role limitations due physical health, | 18.75 | 56.25 | 81.0 | 37.50 | -3.05 | 2.13 |
| Role limitations due to emotional health, | 41.66 | 79.16 | 81.3 | 37.50 | -3.77 | 2.131 |
| Energy/fatigue, | 25.67 | 55.67 | 60.9 | 30.00 | -3.76 | 2.144 |

| | | | | | | |
|-------------------------|-------|-------|-------|-------|-------|-------|
| Emotional well being, | 52.73 | 70.67 | 74.7 | 17.94 | -3.46 | 2.144 |
| Social functioning, | 51.67 | 70.00 | 83.3 | 18.33 | -2.44 | 2.144 |
| Pain | 41.33 | 58.67 | 75.2 | 17.34 | -2.89 | 2.144 |
| General Health | 54.00 | 69.67 | 72.00 | 15.67 | -3.92 | 2.144 |
| Change in Health Status | 45.31 | 76.56 | ----- | 30.25 | -4.04 | 2.131 |

Table 1. Scoring and paired t-test analysis of the RAND SF-36 questionnaire .

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