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Pain relief in cervicogenic headache: A pilot study on manipulative therapy efficacy

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Abstract

Background: Cervicogenic headache (CGH) is a common condition originating from cervical spine dysfunction, often leading to persistent pain and reduced quality of life. Manipulative therapy has emerged as a potential non-pharmacological intervention for managing CGH symptoms.

Objective: This pilot study aimed to evaluate the efficacy of manipulative therapy in reducing pain intensity and improving functional outcomes in patients with cervicogenic headache.

Methods: A pilot study was conducted on a sample of patients diagnosed with cervicogenic headache. Participants received a structured manipulative therapy intervention over a specified period. Pain intensity was assessed using the Numeric Pain Rating Scale (NPRS), and functional improvements were measured using the Neck Disability Index (NDI) both pre- and post-intervention.

Results: Preliminary findings indicated a significant reduction in pain intensity and improvement in neck function following manipulative therapy. Patients reported enhanced mobility, reduced headache frequency, and overall improvement in daily activities.

Conclusion: Manipulative therapy appears to be an effective approach for managing pain and improving function in patients with cervicogenic headache. Further large-scale studies are recommended to validate these findings and optimize treatment protocols.

Keywords: Cervicogenic headache, manipulative therapy, pain management, neck disability index (NDI), numeric pain rating scale (NPRS), functional outcomes

Introductions

Cervicogenic headache (CGH) is a type of secondary headache originating from dysfunction within the cervical spine, including the muscles, ligaments, and joints of the neck. It is estimated that CGH accounts for approximately 15-20% of all chronic headache cases. The hallmark of CGH is its association with neck pain, which can be exacerbated by specific neck movements or postures. Patients suffering from CGH often report reduced neck mobility, headache frequency, and significant impairment in daily activities, which affects their overall quality of life.

Given the musculoskeletal origin of CGH, the management strategies focus primarily on addressing the dysfunctions within the cervical spine. Traditional treatments include pharmacological approaches, physical therapy, and, in some cases, surgical interventions. However, many patients seek alternative non-pharmacological therapies due to the side effects or limited effectiveness of drugs. Manipulative therapy has emerged as a promising option for CGH, involving the application of manual techniques to the spine to improve mobility, reduce pain, and restore functional ability.

The objective of this pilot study was to assess the impact of manipulative therapy on both pain intensity and functional limitations in patients diagnosed with cervicogenic headache. This study aims to contribute to the growing body of evidence supporting the use of non-pharmacological treatments for managing CGH.

Literature Review

Previous studies have demonstrated the potential benefits of manipulative therapy for musculoskeletal pain, particularly in conditions related to the neck. Spinal manipulative therapy (SMT) involves techniques such as high-velocity low-amplitude thrusts (HVLA) and mobilization methods aimed at restoring normal spinal mechanics. Several clinical trials

have shown that SMT can significantly reduce pain and improve function in individuals with neck pain, which is a key component of CGH. Moreover, manipulative techniques have been linked to improvements in neurological function, including reduced headache intensity and frequency. While the evidence supporting manipulative therapy for CGH is promising, further investigation is required to confirm its efficacy and determine the most effective treatment protocols. A few studies have indicated favorable outcomes, but many of these were limited by small sample sizes or lacked rigorous control groups. Thus, the current pilot study aimed to address these gaps by assessing the impact of manipulative therapy on CGH symptoms using reliable outcome measures.

Methods

Study Design

This was a prospective, single-center pilot study conducted over a period of 8 weeks, with a 4-week treatment phase. The study aimed to explore the feasibility, safety, and preliminary effectiveness of manipulative therapy in patients with cervicogenic headache. The protocol was reviewed and approved by an institutional review board (IRB), and all participants provided written informed consent.

Participants

A total of 30 adults aged 18 to 60 years, diagnosed with cervicogenic headache based on clinical and radiological criteria, were recruited for this study. Participants were required to have a history of recurrent headaches for at least 3 months and exhibit neck pain and restricted cervical spine mobility. Exclusion criteria included individuals with a history of significant spinal pathology, previous neck surgery, or other primary headache disorders (e.g., migraine or tension-type headache).

Intervention

The intervention consisted of a structured manipulative therapy program delivered by experienced physical therapists specializing in musculoskeletal rehabilitation. The therapy included spinal manipulations and mobilizations focused on the cervical spine, as well as adjunct techniques such as soft tissue release and postural education. The treatment was administered twice per week for a total of 8 sessions over 4 weeks.

Outcome Measures

Two primary outcome measures were used to assess the effectiveness of the intervention:

- **Numeric Pain Rating Scale (NPRS):** This scale was used to assess pain intensity, with scores ranging from 0 (no pain) to 10 (worst pain imaginable). The NPRS was administered at baseline and at the end of the treatment phase to measure changes in pain intensity.
- **Neck Disability Index (NDI):** The NDI was used to measure functional disability related to neck pain, with higher scores indicating greater disability. The NDI assesses a range of activities such as work, personal care, and physical activity, all of which are affected by neck pain. Changes in NDI scores from baseline to post-treatment were analyzed to evaluate functional outcomes.

Statistical Analysis

Descriptive statistics were used to summarize the demographic characteristics of the participants. Paired t-tests were conducted to compare pre- and post-intervention pain intensity and NDI scores. A significance level of $p < 0.05$ was set for all statistical tests.

Results

Participant Demographics

A total of 30 participants (18 women, 12 men) completed the study. The mean age was 42.5 years (range: 20-59 years). All participants had a diagnosis of cervicogenic headache, with a mean duration of headaches of 18 months (range: 6-48 months).

Pain Intensity (NPRS)

At baseline, the average NPRS score was 7.8 (± 1.2), indicating moderate to severe pain. Post-treatment, the average NPRS score decreased to 4.3 (± 1.5), representing a 45% reduction in pain intensity. This change was statistically significant ($p < 0.001$).

Neck Function (NDI)

The baseline mean NDI score was 22.3 (± 5.6), suggesting moderate disability due to neck pain and headache. Post-treatment, the average NDI score decreased to 14.5 (± 4.7), reflecting a 35% reduction in functional disability. This change was also statistically significant ($p < 0.01$).

Additional Findings

Participants reported a reduction in headache frequency, with many experiencing fewer episodes of intense pain. Several participants noted improved neck mobility, including the ability to perform tasks like driving, working at a computer, and engaging in physical activities with less discomfort. Overall, there was a reported improvement in quality of life, particularly in relation to daily functioning.

Discussion

This pilot study provides preliminary evidence supporting the use of manipulative therapy for the management of cervicogenic headache. The significant reductions in both pain intensity and disability observed in the participants align with findings from previous studies on spinal manipulation for musculoskeletal pain. The results suggest that manipulative therapy may help alleviate the symptoms of CGH by improving cervical spine mobility, reducing muscle tension, and addressing dysfunctional spinal segments.

While the findings of this study are promising, they must be interpreted with caution due to the small sample size and the lack of a control group. Larger randomized controlled trials are needed to confirm these results and determine the optimal treatment parameters, such as the frequency and duration of therapy.

Conclusion

Manipulative therapy appears to be an effective non-pharmacological treatment for reducing pain and improving function in patients with cervicogenic headache. The significant improvements in pain intensity and neck disability observed in this pilot study suggest that this approach may enhance the quality of life for individuals affected by CGH. Further studies are warranted to validate

these findings and optimize treatment protocols for broader clinical use.

Future Directions

Future research should focus on larger, multicenter trials that incorporate control groups and consider long-term outcomes. Additionally, investigating the mechanisms underlying the effectiveness of manipulative therapy and comparing it with other non-pharmacological treatments could provide valuable insights into its role in managing cervicogenic headache.

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