The Effectiveness of Manual Therapy on Headache Intensity and Frequency among Patients with Cervicogenic Headache: a Systematic Review and Meta-Analysis

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Registration
The protocol for this meta-analysis was registered on PROSPERO under the registration number CRD42021249277

Key words
Post-traumatic headache (MeSH), Cervicogenic headache, Musculoskeletal manipulations (MeSH), Manual therapy, Exercise therapy (MeSH), Randomized controlled trial (MeSH), Randomized controlled trial as a topic (MeSH).

Design
Systematic review and meta-analysis

Background
Cervicogenic headache (CGH) is a secondary type of headache, with a prevalence of 1-4% among patients with headache1. Manual therapy (MT) is among the most common treatment choices for headaches in Australia, and in the USA, with a mean prevalence of 32.3% among patients with headache, with a prevalence of 1-4% among patients with headache2. In Europe and in the USA, with a mean prevalence of 32.3%

Objectives
To appraise the effectiveness of MT and ExT for CGH intensity (HI) and frequency (HF) when compared to sham, no treatment or other interventions.

Methods
The systematic review was performed following the PRISMA guidelines. 7 electronic databases were searched, with no language restrictions. Table 1 describes the exclusion and inclusion criteria.

Results
The literature search identified 70 potentially relevant studies. After the title, abstract and full text screening, 16 studies were included in the final review, with a total of 1132 patients. The literature search and the studies selection processes are described in Figure 1. The main characteristic are found in Table 2. Due to heterogeneity in the design, only 7 studies were included in the meta-analysis, which was feasible for HI and HF both at short and long term. Data pooling was possible only for studies using sham as a comparator, as not enough studies were comparing the intervention to no treatment control or to comparable other interventions.

Sensitivity analysis including only the 2 studies with low RoB were assessing the effects of spinal manipulations. Both studies included in this analysis were assessing the effects of spinal manipulations. Both studies included in this analysis were assessing the effects of spinal manipulations. The main limitations of this study were the heterogeneity in the intervention protocols and the RoB across trials, which decreased the strength of the review. Small group sizes and design heterogeneity also limited the number of trials eligible for meta-analysis. Nonetheless, further research with more low-RoB trials and larger sample sizes is necessary to confirm the strength of these recommendations.

Discussion
There is moderate quality of evidence favouring the use of MT and ExT to reduce HI and HF at short and long term in patients with CGH, when compared to sham interventions. The sensitivity analysis showed similar results, although with a small effect size. Both studies included in this analysis were assessing the effects of spinal manipulations. The main limitations of this study were the heterogeneity in the intervention protocols and the RoB across trials, which decreased the strength of the review. Small group sizes and design heterogeneity also limited the number of trials eligible for meta-analysis. The systematic review analysed a gap in the literature individualized by recent guidelines and provided encouraging evidence in favour of MT and ExT for the management of CGH, especially in regards to spinal manipulations.

References
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