UAMS EM Journal Club
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Use of alternative non-pharmacologic therapies as treatment for chronic low back pain.

Clinical Bottom Line:

We recommend the use of non-pharmacologic strategies for pain management for the treatment of chronic back pain. There is promising evidence for the use of alternative therapies (including acupuncture, pain reprocessing therapy, and virtual reality) for chronic back pain when compared to usual treatment for reduction in pain intensity.

PICO Question:

In patients with chronic low back pain does the use of non-pharmacologic alternative therapies compared to their standard medical management improve outcomes in their pain?

Background:

Chronic low back pain is a common presenting problem both to primary care offices and emergency departments. It is an important cause of disability worldwide as well. Although low back pain can be related to multitude of different underlying etiologies, acute low back pain, without concerning history or symptoms, can be treated with many different treatment modalities. US guidelines suggest attempting non-pharmacologic therapies prior to starting pharmacologic treatments. Although several different pharmacologic therapies are available for treatment, there are less available treatments for non-pharmacologic therapies. Therefore, we explored evidence behind the use of alternative therapies, including acupuncture, pain reprocessing therapy and virtual reality for treatment of low back pain.

Article 1:

Ashar YK, Gordon A, Schubiner H, et al. Effect of Pain Reprocessing Therapy vs Placebo and Usual Care for Patients With Chronic Back Pain: A Randomized Clinical Trial. JAMA Psychiatry. 2022;79(1):13–23. doi:10.1001/jamapsychiatry.2021.2669

Pubmed link:

https://pubmed.ncbi.nlm.nih.gov/34586357/

Risk of Bias: Some risk of bias as patients were aware of their intervention group status and randomization was not concealed. Risk of bias was minimized by using an imbalance minimization algorithm to evenly distribute participants into as evenly distributed groups as possible given demographic information and cofounders.

The Basics:

This was a randomized control trial including participants with chronic back pain looking at improvements in pain intensity after treatment with either Pain Reprocessing Therapy, vs Placebo, vs usual treatment.

Methods:

Participants were recruited and enrolled in the Boulder Colorado area from August 2017 to November 2018 with one year follow-up completed by Nov 2019. Inclusion criteria were patients aged 21-70yrs who experienced back pain greater than half the days over a 6 month period with and average pain score >4/10. Exclusion criteria included reported leg pain greater than back pain and history of metastatic cancer and autoimmune conditions, and those ineligible for MRI. 151 total patients were randomized into three study arms: Pain Reprocessing Therapy (PRT), placebo, or usual treatment. All participants completed an initial baseline assessment, pain score, and MRI. Primary endpoint was fMRI one month after initial MRI, followed by assessments at 1,2,3,6, and 12 months following repeat MRI.

PRT groups completed an initial telehealth evaluation then completed 8 one hour therapy sessions, twice weekly over 4 weeks. Placebo group watched 2 videos on the efficacy of placebo treatments for pain known to be benign. They also received a subcutaneous saline injection at the point of maximal pain by a physician at an orthopedic center. Usual care groups were given no additional intervention and agreed to continue their usual ongoing care.

Primary outcome was average pain score (0-10) over the last week at the one month mark (postbaseline), specifically looking at reported pain reduction of at least 30%, 50%, or score of 0-1.

Results:

151 total patients randomized, 50 in PRT, 51 in placebo, 50 in usual care. Of the 50 participants in the PRT group, 44 completed all treatment sessions and posttreatment assessment. Of the 51 pt's in placebo group, 44 received the intervention and completed posttreatment assessment. Of the 50 in usual care, 47 completed the posttreatment assessment.

Participants in the PRT group reported significantly reduced pain scores at the posttreatment assessment 1.18 from 4.22 at baseline, compared to 2.84 in placebo (4.16 at baseline), and 3.13 in usual care group (3.91 at baseline). 73% of pt's who

completed the treatment in the PRT group also reported pain scores of 0-1 at posttreatment compared to 20% of placebo and 10% of usual care.
At the 1 month (posttreatment) fMRI, PRT group reported significant pre to post treatment reduction in evoked back pain compared to placebo and usual care. PRT participants had significantly reduced pain related activity in the anterior midcingulate cortex and anterior prefrontal cortex compared to placebo and and reduced pain activity in the left anterior insula compared to usual care.

Limitations/bias:

Limitations of this study included the study population being relatively active and well educated at baseline with low to moderate pain scores and reported disability. This limits the generalizability of this study. Another limitation is access to therapists well versed in pain reprocessing therapies.

Article 2:

Skonnord, Trygve, et al. "Acupuncture for acute non-specific low back pain: A randomised, controlled, multicentre intervention study in general practice—the ACUBACK study." *BMJ Open*, vol. 10, no. 8, 2020, https://doi.org/10.1136/bmjopen-2019-034157.

Pubmed link: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7412620/

Risk of Bias:

Low risk of bias due to the participants being randomized by a health secretary using a web-based randomization system. However, the patients and GPs were aware of being part of the intervention or control group given the nature of the intervention involving acupuncture.

The Basics:

This was a multicenter, randomized controlled trial with an aim to evaluate whether a single treatment session of acupuncture reduces the time of recovery compared to standard treatment alone.

Methods:

Between March 2014 and 2017, 100+ adults were enrolled in the study. These are adults who are aged 20-55years of age, presenting to their General Practitioner complaining of acute low back pain (defined as back pain lasting 14days or less. Exclusion criteria used was nerve roof affection, "red flags", pregnancy, disability pension, sick leave for more than 14 days and acupuncture during the last month. There

were 11 Norwegian GP's offices participating in the study. There was a health secretary assigned who used a computerized system to randomize the patients to either control or study groups. Standard group treatment consistent of advice about activity, prescription of analgesic medication and sick leave. For the Acupuncture group (AG), patient's received one session of acupuncture with a trained professional. The primary outcome was days to recovery, defined as the first day of pain of 0 to 1. Secondary outcome was pain intensity, disability, sick leave, global improvement, use of medications, new visits to the GP's office, and health related quality of life. Patient surveys were used as a method of data collection. There was one patient lost to follow-up in the control group.

Results:
There were a total of 185 participants randomized with 95 in the control group and 90 in the AG. 14 participants did not receive the allocated intervention and 4 were excluded from analysis. 167 were included in the analysis and overall baseline were similar, per analysis reported. Recovery time was 14days for control group and 9 days for the AG. Even though these results were reported, using the Cox regression model, the difference of 5 days was not statistically significant. There were several different variations of statistical analysis performed on the data; however, with similar results where no change in the primary outcome was noted. Overall, including the same with secondary outcomes, no statistically significant outcome was noted. Although, with the data presented, there was favorable data towards the AG with improvement in pain, with less days of recovery time, etc. However, none of this data was statistically significant.

Limitations/bias:
The main limitation of the study was the low number of participants. Less than 200 participants despite extending the inclusion period for a whole year. The results could represent a type II error, meaning this could mean that this may not be the true effect of acupuncture. Additionally, due to the type of data collection, there was limited amount of analysis that could be performed in the data that was gathered.

Article 3:
Grassini S. Virtual Reality Assisted Non-Pharmacological Treatments in Chronic Pain Management: A Systematic Review and Quantitative Meta-Analysis. Int J Environ Res Public Health. 2022 Mar 29;19(7):4071. doi: 10.3390/ijerph19074071. PMID: 35409751; PMCID: PMC8998682.

Pubmed link: https://pubmed.ncbi.nlm.nih.gov/35409751/

Risk of Bias:

High risk of bias. The paper was written by one individual without a peer-reviewing system, making the analysis of a systematic review very one-sided.

The Basics:
A systematic review of published literature examining responses to chronic back pain being treated with various kinds of virtual reality (VR) therapies.

Methods:
Multiple literature databases were searched using various keywords to identify randomized control trials (RCTs) that used virtual reality (VR) software as an alternative therapy to pharmacologic therapy for treatment of chronic back or neck pain. These articles were then evaluated for the relative effectiveness of VR therapy in treatment of chronic pain, and individual bias was evaluated from each study using the Newcastle-Ottawa scale. Various outcome measurements used were targeted towards evaluating the relative relief of the patient's pain using metrics such as the visual analog scale, Tampa kinesiophobia scale, and others. These studies were compared and statistical analysis was performed to evaluate if there was meaningful improvement in reported or measured pain while using VR therapy.

Results:
9 studies were evaluated including a total population of 524 patients experiencing chronic neck and or back pain. Evaluations of primary outcomes showed no significant improvement in VAS scores overall between all included studies. The analysis of two RCTs demonstrated statistically insignificant favorable results of VR therapy in reducing ODI over care as usual (MD: −0.67 (−7.81, 6.46), *p*-value: 0.85 I2: 73%).

Limitations/bias:

There was overall low bias as evaluated using the Cochrane risk of bias assessment tool between the included studies according to the paper. The paper itself does suffer from a high overall risk of bias as each study was evaluated by only a singular author for eligibility for inclusion, and this singular author also performed all statistical analyses and risk of bias assessments. The paper was also somewhat limited as only 9 studies met criteria with a low total *n* represented.