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Research Paper Review

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Efficacy of Directional Preference Management for Low Back Pain: A Systematic Review

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ABSTRACT

Background

Providing specific treatment based on symptom response for people with low back pain (LBP) and a directional preference (DP) is a widely used treatment approach. The efficacy of treatment using the principles of directional preference management (DPM) for LBP is unclear.

Objective

The purpose of this study was to determine the efficacy of treatment using the principles of DPM for people with LBP and a DP.

Methods

Computer databases were searched for randomized controlled trials (RCTs) published in English up to January 2010. Only RCTs investigating DPM for people with LBP and a DP were included. Outcomes for pain, back specific function, and work participation were extracted.

Results

Six RCTs were included in this review. Five were considered high quality. Clinical heterogeneity of the included trials prevented meta-analysis. GRADE quality assessment revealed mixed results; however, moderate evidence was identified that DPM was significantly more effective than a number of comparison treatments for pain, function, and work participation at short-term, intermediate-term, and long-term follow-ups. No trials found that DPM was significantly less effective than comparison treatments.

Conclusions

Although this systematic review showed mixed results, some evidence was found supporting the effectiveness of DPM when applied to participants with a DP, particularly at short-term and intermediate-term follow-ups. Further high-quality RCTs are warranted to evaluate the effect of DPM applied to people with LBP and a DP.

ANALYSIS

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Background Information
Clinicians have a wide variety of treatment options for individuals with low back pain (LBP). Based on recent evidence (see the 'Clinical Prediction Rule' section in Related Reviews below), most clinicians believe that LBP patients should be classified into a variety of subgroups that subsequently directs specific treatment. We should be well aware, by now, that not all cases of LBP are the same!

Mechanical loading strategies (MLS) are used in the classification and specific treatment of LBP. These treatment strategies involve repeated movements and sustained postures (such as flexion or extension). The McKenzie method (also known as mechanical diagnosis and therapy or MDT) is an example of a MLS that is commonly used for management of LBP. Robin McKenzie has written extensively on the examination of the mechanical diagnosis and associated therapy - we would highly recommend this read as it is one important component of orthopedic musculoskeletal practice (1).

Incorporating MLS may identify the presence of centralization, which is defined as the proximal movement or abolition of distal symptoms originating from the spine in response to the application of MLS. Related with centralization is the concept of directional preference (DP), which is the direction of MLS that results in the most centralization. DP is a widely used treatment approach where the most prevalent DP movement is into extension for the lumbar spine. However, the value of treatment using directional preference management (DPM) for LBP is unclear.

This study undertook a systematic review of RCTs to evaluate the effectiveness of DPM specifically applied to patients with LBP with a DP compared with no treatment, a placebo treatment, or other treatments.

PERTINENT RESULTS

Six quality trials, randomizing 474 participants, were identified as being eligible for inclusion. Variation in clinical presentation was noted among trials (LBP, leg symptoms, neurological signs, mixed duration). It was also noted that the trials had varying forms of treatment, including DPM with co-interventions (passive mobilization techniques, general exercise, lumbar stabilization exercises). Comparison interventions included a combination of strengthening and stabilization exercises, a lumbar stabilization program, orthopaedic manual therapy (including self-mobilization and stretching exercises), manipulation, general exercise, exercises performed in the opposite direction from the identified DP, advice, passive mobilization and placebo.

All trials presented short-term follow-up measures, two presented intermediate-term follow-up and 2 trials collected long-term follow-up data. All studies reported non-specific outcome measures (Functional Status, Oswestry Disability, Roland-Morris Disability) and 5 reported pain intensity (VAS,

numeric rating). Pain interference at work was presented in one study. Since there was significant clinical heterogeneity of the included trials the authors were unable to perform a meta-analysis.

GRADE quality of evidence was downgraded due to limitations in the study design, inconsistency due to conflicting results, imprecision due to sparse data and indirectness due to clinical heterogeneity. However, the GRADE assessment revealed some positive results for DPM as mode of therapy for low back pain patients. There was moderate evidence of support for DPM compared with manual therapy, multidirectional mid-range exercises and advice for pain, function, and work participation at short-term and intermediate-term follow-up time frames.

This systematic review also demonstrated some results for DPM that were less than promising. Non-significant results were found on pain and function compared with strengthening or stabilizing exercise programs at short-term follow-up and of the effect of DPM on function compared with manual therapy at short-term follow-up.

In addition, there is moderate evidence of:

- No difference between DPM and stretching and strengthening program for improving long-term function
- No difference between DPM and manual therapy for reducing leg pain and long-term back pain
- No difference between DPM and advice for reducing long-term back pain

No trials found that DPM was significantly less effective than comparison treatments.

CLINICAL APPLICATION & CONCLUSIONS

Preliminary evidence from this study found some support for the effectiveness of DPM for people with LBP and DP. Fifty-eight percent of the pain, function and work participation outcome measures favored DPM over comparison treatments. However, only forty-eight percent of the favored outcomes were deemed to be clinically relevant.

In spite of the mixed results, there were large effect sizes in some of the high-quality studies along with one low-quality study. The large effect sizes where found to favor DPM compared with advice, exercises in opposite direction from the identified DP with advice, passive mobilization, advice alone and stabilization programs, particularly at short-term and intermediate-term follow-ups.

Looking at the big picture, the evidence in general was mixed, with a number of trials in support and a number of trials conflicting, or showing no effect. This is a classic example of a systematic review that truly requires further high-quality RCTs to concretely evaluate the effect of DPM on the LBP population.

Clinically, many therapists can attest to good results applying DPM to a specific intended subgroup of targeted low back pain patients. These clinical results with promising research would support applying DPM to everyday practice. However, one's clinical results applied with best-evidence approach (such as the limited results from this systematic review) are only as relevant as the application of the treatment to the correct patient population. There is variability in the literature regarding the operational definitions of centralization. Therefore, it is important for clinicians to become familiar with the clinical patterns

associated with centralization so they can apply these findings to the appropriate patient population within their everyday practice – One tool for one specific patient population.

In addition, it is important to standardize the operational definition for centralization and DPM. This is crucial to both our clinical practice and research to help homogenize this patient population. We all know targeting specific subgroups rather than the heterogeneous populations with nonspecific LBP, particularly providing specific treatment based on symptom response for patients with a DP, will give us the best results.

STUDY METHODS

Research databases were searched for randomized controlled trials published in English up to January 2010. Only RCTs investigating DPM for people with LBP and a DP were included. Trials involving male and female participants aged > 18 with lumbar pain with or without leg symptoms described as having LBP with a DP were included. Participants with symptoms of any duration were included. However, it should be noted that subgrouping was completed for length of symptoms as follows: acute (< 6 weeks), subacute (6–12 weeks), and chronic (> 12 weeks).

Trials evaluating the effect of DPM on LBP with a DP compared with no therapy, placebo, or other conservative treatments were included. Directional preference management was defined as individualized treatment based on the response to MLS. Trials were included where DPM was used with co-interventions.

The outcomes of primary interest for this systematic review were measures of pain intensity, low back–specific function, and work participation. Data were independently extracted from the included trials by the 2 reviewers and recorded on a standardized computer spreadsheet.

Each reviewer independently evaluated the clinical relevance of included trials using the 5 criteria recommended by the Cochrane Back Review Group (2). A qualitative analysis using the GRADE approach was used to evaluate the quality of evidence for individual outcomes based on domains including limitations of study design and risk of bias, inconsistency of results, indirectness, imprecision of results, and publication bias (3).

STUDY STRENGTHS / WEAKNESSES

There are several methodological issues that were noted during the review of the included trials. Some of the limitations in the studies analyzed included: limited follow-up of 2 weeks combined with a large number of dropouts and withdrawals, a comparison group treatment expected to be less effective than standard treatment in most clinical settings, DPM being provided by a single practitioner which limited the generalizability of the results and small sample sizes with associated wide confidence intervals. In addition, there was a lack of description of the interventions limiting reproducibility in the clinical setting and for future RCTs.

Future research should focus on reproducing the DPM protocols and comparison groups of trials, particularly where there was evidence of large effect sizes. Unfortunately, it will be extremely difficult to reproduce these studies due to the lack of description provided in the studies. Therefore, researchers

conducting future studies should be cognizant of their study's protocol to improve clinical applicability.

An important strength that should be noted with this study is the targeted specific subgroups for the nonspecific LBP patients analyzed the RCT selection criteria. The concept of treatment targeted to a specific subgroup is inherent to DPM and the authors' choice of studies for inclusion was consistent with this clinically important point.

Additional References

1. McKenzie R, May S. The Lumbar Spine: Mechanical Diagnosis and Therapy. 2nd ed. Waikanae, New Zealand: Spinal Publications New Zealand Ltd; 2003.
2. van Tulder M, Furlan A, Bombardier C, et al. Updated method guidelines for systematic reviews in the cochrane collaboration back review group. Spine (Phila Pa 1976). 2003;28:1290–1299.
3. Clinical Evidence. What is GRADE? Available at: http://clinicalevidence.bmj.com/ceweb/about/about-grade.jsp.

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