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Early use of thrust manipulation versus non-thrust manipulation: A randomized clinical trial
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ABSTRACT

The purpose of this study was to investigate the comparative effectiveness of early use of thrust (TM) and non-thrust manipulation (NTM) in sample of patients with mechanical low back pain (LBP). The randomized controlled trial included patients with mechanically reproducible LBP, \geq age 18-years who were randomized into two treatment groups. The main outcome measures were the Oswestry Disability Index (ODI) and a Numeric Pain Rating Scale (NPRS), with secondary measures of Rate of Recovery, total visits and days in care, and the work subscale of the Fears Avoidance Beliefs Questionnaire work subscale (FABQ-w). A two-way mixed model MANCOVA was used to compare ODI and pain, at baseline, after visit 2, and at discharge and total visits, days in care, and rate of recovery (while controlling for patient expectations and clinical equipoise). A total of 149 subjects completed the trial and received care over an average of 35 days. There were no significant differences between TM and NTM at the second visit follow-up or at discharge with any of the outcomes categories. Personal equipoise was significantly associated with ODI and pain. The findings suggest that there is no difference between early use of TM or NTM, and secondarily, that personal equipoise affects study outcome. Within-groups changes were significant for both groups.

ANALYSIS

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Background Information

Early use of manipulative care has been advocated for patients with low back pain. The development of a clinical prediction rule (CPR) and prognostic indicators such as 'within-between session changes', have indicated that manual treatment is effective in a select subgroup of our patients. Many forms of spinal manipulative techniques exist, but to date, there have been only a couple of studies which have attempted to compare thrust manipulation (TM) to non-thrust manipulation (NTM). In the couple of studies that exist, the NTM used was dissimilar to those typically performed in practice (1) and the techniques did not involve a 'patient-response', nor was the technique directed at the comparable level of the spine (2). Because of this, most practitioners choose techniques based upon clinical reasoning and the assessment of results, versus true clinical evidence.

Therefore, the goal of the present study was to determine if TM is truly more effective than early application of NTM, in a sample population of individuals with mechanical low back pain (LBP).

PERTINENT RESULTS

Primary Outcome Measures:

- 149 individuals with mechanical LBP completed this trial. The TM group consisted of 41 males and 35 females and NTM consisted of 29 males and 44 females. The duration of symptoms in the NTM group was 37.7 weeks and TM was 30.2 weeks. These individuals were treated by seventeen Physical Therapists, who underwent extensive post-graduate education in manual therapy, across the United States.
- MANCOVA was used and demonstrated no significant differences between the two groups (FABQ-w: $P = .83$, Rate of recovery: $P = .40$, total visits: $P = .48$, and days of care: $P = .34$)
- The researchers found that there were no between group differences in pain and disability with early use of TM versus NTM (two-way mixed model MANCOVA).
- A clinical equipoise of each participating clinician was evaluated prior to the study, to determine personal opinion regarding TM and NTM and if they had a pre-conceived notion whether one treatment approach was more effective than the other. *It was determined that this significantly influenced the combined dependent variable, and a univariate analysis revealed that personal equipoise significantly influenced pain and disability in the subjects.*

CLINICAL APPLICATION & CONCLUSIONS

The results of this study indicate that there is no difference between early use of TM or NTM, in the treatment of mechanical LBP. This finding is quite novel because others have claimed that early use of TM, in individuals that fit a CPR, is superior to lower velocity techniques (3, 4). The researchers in this study allowed the practitioners to choose the type of TM or NTM used, which corresponds with typical practice and enhances the clinical applicability of these results.

Unlike similar studies, the researchers accounted for practitioner bias by administering a clinical equipoise. As suspected, the researchers found that personal bias (and a lack of-) does influence outcomes. This is an important result of this study, serving as a strong reminder to all of us that how we approach a clinical condition and its treatment options can certainly influence the clinical results we achieve. As always, we should strongly consider our own personal clinical experience as well as the

preferences of our patients – perhaps they have had prior success with either TM or NTM – a factor that we should consider when selecting our treatment approach.

STUDY METHODS

This study was a randomized-controlled trial, comparing thrust vs. non-thrust manipulation on a patient population with mechanical low back pain. Participants enrolled in this study were from sixteen distinct outpatient physical therapy practices (seventeen practitioners) across the United States.

Inclusion criteria for this study included: age > 18, mechanically reproducible LBP and a within-between session change (improvement in pain and/or range of motion) during the assessment phase of the examination.

Exclusion criteria included the presence of any red flags or signs consistent with nerve root compression. In addition, the researchers excluded individuals with prior lumbar surgeries, current pregnancy, or loss of participation by the second session.

The enrolled participants, after experiencing a within-session change during the initial evaluation (with mobility assessment), were randomized (by a roll of dice) to receive either thrust or non-thrust manipulation, to the lumbar spine. The randomized allocation determined the treatment the participants would receive for the first two visits. In addition to the randomization, both groups were given a standardized home exercise program that included hamstring/piriformis stretches, quadruped cat/camel, and prone press-ups for lumbar extension. These exercises were performed 3 times each day for 10 repetitions each through the first 2 sessions of care. They could then be modified or eliminated at the therapist's discretion after the second visit. In all cases, the clinician was allowed to select which particular thrust or non-thrust manipulation they felt would most benefit that participant and target that intervention at the most comparable level (in an attempt to replicate clinical practice). NTM techniques were defined on the original concepts of Geoffrey Maitland, and consisted of passive, low-velocity, oscillatory movements within the physiological range of the joint, at the most comparable level. TM techniques consisted of high-velocity, low amplitude end range procedures, that were targeted at the most comparable segment.

After completion of the first two visits, clinicians were allowed to perform any treatment procedure they felt would be beneficial, in addition to manual therapy, and could discharge the participant once they felt the participant had reached maximal improvement.

All participants provided demographical information (height, weight, age, gender, race, duration of symptoms and total days under care) and completed self-report questionnaires (Fear Avoidance Beliefs Questionnaire work subscale-FABQ-w, Oswestry Disability Index-ODI and Numeric Pain Rating Scale-NPRS) at baseline. Follow-up self-report findings were collected at the second visit and discharge (except for the FABQ-w).

STUDY STRENGTHS / WEAKNESSES

Study Strengths

- The study was the first to account for personal bias/equipoise. Clinician interaction can (and does) influence outcomes and this study accounted for this variable.
- The study compared commonly used manual interventions and allowed clinician choice, which enhances the clinical applicability and external validity
- The study was built around the concept of the 'patient response' and we have discovered that 'patient response' in regards to within-between session changes, is prognostic of outcomes (see Related Reviews below).

Study Weaknesses

- Lack of control group
- No long-term follow-ups – the final measures were conducted at discharge
- A therapists own skills and abilities may have influenced perception of clinical equipoise, thus influencing outcomes
- The sample was overwhelmingly Caucasian (136 out of 149) and this may confound clinical applicability or external validity in certain regions.

Additional References

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