

Brantingham JW, Parkin-Smith G, et al. Full kinetic chain manual and manipulative therapy plus exercise compared with targeted manual and manipulative therapy plus exercise for symptomatic osteoarthritis of the hip: a randomized controlled trial. Arch Phys Med Rehabil 2012;93:259-67.

Design: randomized clinical trial

Study question: In patients with osteoarthritis (OA) of the hip who are receiving manual and manipulative therapy (MMT) plus exercise, does the addition of full kinetic chain manipulation improve clinical outcomes compared with MMT which is targeted at the affected hip joint?

Population/sample size/setting:

- 108 patients (49 men, 59 women, mean age 63) treated for hip OA at 2 chiropractic teaching clinics in Australia
- Eligible patients were age 40-85 with a diagnosis of mild to moderate hip OA based on Kellgren-Lawrence grades 0 to 3, with less than 15 degrees of internal rotation and less than 115 degrees of hip flexion, ability to stand and walk for three quarters of the day without assistance, and passing a fall risk assessment by standing on one leg for more than seconds
- Exclusion criteria were K-G grade 4 degenerative changes, possibility of disorders that would prevent participation in performing exercises, history of herniated lumbar disc or low back injury, bilateral symptomatic hip OA, and the possibility of serious medical or psychiatric disorders

Interventions:

- Patients were randomized to targeted MMT plus exercise (n=58) or to full kinetic chain MMT plus exercise (n=53)
- Both groups received 9 sessions of 30 minutes in which they had MMT, for a total of 4.5 hours of treatment
- Both groups received similar instruction for safely increasing exercise (walking, progressing toward daily aerobic exercise) after the fifth week (the final MMT visit), with advice to keep active and slowly increase their exercise as tolerated
- Targeted MMT group at each session received high-velocity, low-amplitude thrust-type MMT with pre-and posttreatment stretch of the same hip muscles (gluteus, psoas, etc), followed by assisted active stretch of tight muscles around the hip
- Full kinetic MMT group at each session received targeted MMT, with additional regional MMT maneuvers at the discretion of the clinician (guided by the patient's toleration for and lack of contraindications to MMT)
 - o Lumbosacral and/or SI joints HVLA manipulation as appropriate
 - o MMT of ipsilateral knee with flexion and extension mobilization, with the option of adding forced knee flexion

- Ipsilateral ankle MMT with mortise separation and anteroposterior distal fibula MMT
- Ipsilateral foot MMT applied to tarsal bones and the subtalar joint as appropriate

Outcomes:

- Main outcome was change on the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) which was normalized to have a minimum score of 0 and a maximum score of 2400 for the 24 items in the index
- Secondary outcomes were the Harris Hip Score (HHS) and an Overall Therapy Effectiveness (OTE) tool
 - HHS score of 90 to 100 is excellent, 80 to 89 is good, 70 to 79 is fair, 60 to 69 is poor, and under 60 is treatment failure
 - OTE is dichotomized into 2 categories (improved and not improved)
- Followup was done at baseline, at week 5, and at 3 months
- Between-group statistical analysis did not show a difference for either the primary or the secondary outcomes
 - A minimal clinically important difference was set at 20% of the WOMAC scale; the range was only 1% to 5% in group means of the 5 week and 3 month followup points
 - However, both groups had substantial changes in their WOMAC scores
 - The targeted group began with a WOMAC score of 1163 and ended with a score of 662; the full kinetic chain group began with a score of 1148 and ended with a score of 764 (the targeted group was slightly better on WOMAC at the end of 3 months)

Authors' conclusions:

- This is the first randomized trial comparing targeted MMT with full kinetic chain MMT for hip OA with a 3 month followup
- Targeted and full kinetic chain MMT with similar exercise programs appear to provide equivalent benefits after 3 months for hip OA
- There was no control group with placebo or no treatment, and the characteristically fluctuating course of hip OA could have been influenced by the Hawthorne effect, in which being observed in a scientific study can influence the course of symptoms of a disease
- Full kinetic chain MMT does not appear to confer benefits in addition to those of targeted MMT for hip OA

Comments:

- Most aspects of a high-quality trial are present, given that blinding is not feasible; allocation concealment of a well-generated randomization process, and good retention of patients, all tend to support the overall conclusion that the two approaches to MMT offered very similar benefits
 - o The study appears to have had approximately 80% power to detect a difference of “3 points” in outcome measures may mean that the sample size was sufficient to detect a 30% difference in WOMAC, but not necessarily a 20% difference
 - o The small observed differences of 1% to 5% may represent an adequately powered study to detect a 20% difference, since sample sizes are approximations based on often speculative assumptions about the distribution of outcome scores in the population of interest
- The experimental (full kinetic chain) group received interventions which were at the discretion of the practitioners, and were not standardized
 - o In a pragmatic trial such as this one, this is not necessarily a problem, since greater problems could arise from application of a rigid standardized protocol which essentially ignored the condition and responses of the individual patient
- A potential problem arises from the fact that the treatment sessions were constrained to last 30 minutes, regardless of whether MMT was being directed at joints other than the hip
 - o If such additional joint manipulation were done at the expense of manipulations targeted at the hip joint, the potential beneficial effect of supplementing hip manipulation with attention to other joints could be obscured
 - o It might be debated whether a trial which does not allow for additional time to be spent on the pelvis, knee, ankle, and foot represents a fair comparison to a treatment program which allocates additional time for the additional joint manipulations
 - o However, if time constraints are an important aspect of daily practice, this may not be a flaw that would undermine the study conclusions

Assessment: adequate for some evidence that in the setting of symptomatic hip OA of Kellgren-Lawrence grades 0 to 3, nine 30 minute sessions of MMT targeted at the hip are as beneficial as nine 30 minute sessions of MMT with additional manipulations of joints in the kinetic chain, such as the lumbar, knee, ankle, and foot joints, when both programs are accompanied by gradually increasing exercise instructions