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Effect of Mc Kenzie's Manual Treatment with Conventional Physiotherapy in Subject with Osteoarthritis Shoulder

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Abstract

Background: Osteoarthritis (OA) of the shoulder is a prevalent degenerative joint disease characterized by pain, stiffness, and functional disability. Physiotherapy treatment with manual therapy and exercise is popular for symptom control. The purpose of this study was to compare McKenzie's Manual Treatment combined with Conventional Physiotherapy versus Conventional Physiotherapy alone for patients with shoulder OA.

Methods: A randomized controlled trial was carried out on 60 patients aged between 40 and 70 years with a diagnosis of shoulder OA. The participants were randomly divided into two groups: the intervention group was administered McKenzie's Manual Treatment along with standard physiotherapy, whereas the control group was administered conventional physiotherapy alone. Treatment for both the groups was done for four weeks. The outcome measures were Shoulder Pain and Disability Index (SPADI) and Numerical Pain Rating Scale (NPRS), which were measured pre- and post-intervention.

Results: Both groups had significant improvement in pain and function of the shoulder. The intervention group had more decrease in SPADI scores (from 74.53 ± 19.2 to 10.4 ± 5.10) and NPRS scores (from 7.86 ± 1.66 to 2.86 ± 1.14) with highly significant p-values ($p < 0.001$). The control group also had significant but less improvement. Comparative analysis verified the greater efficacy of addition of McKenzie's Manual Treatment.

Conclusion: The addition of McKenzie's Manual Treatment to the standard physiotherapy is a better method for alleviating pain and disability in patients with shoulder OA than physiotherapy alone. Adding manual therapy techniques to rehabilitation programs could improve clinical results in such patients.

Keywords: Shoulder osteoarthritis, Manual Treatment according to McKenzie, physiotherapy, manual therapy, shoulder pain, shoulder disability, randomized controlled trial, rehabilitation, musculoskeletal surgery, pain management

1. Introduction

Osteoarthritis of the shoulder is a progressive and chronic condition that mainly involves the glenohumeral and acromioclavicular joints, causing joint articular cartilage breakdown progressively. This cartilage is composed of a protective layer of fibrous tissue that helps to cushion the bones with ease and without pain. With progression of osteoarthritis, the cartilage degenerates, leaving bone surfaces exposed. This creates friction between the bones on movement, which results in pain, stiffness, and extensive limitation of shoulder mobility. The condition is more prevalent in patients above the age of 50, but it can also occur as a result of past injuries, repetitive mechanical stress, or genetic predisposition. Shoulder osteoarthritis patients typically complain of chronic pain, the inability to execute overhead activity, and grinding or clicking sensation inside the joint.

With time, inflammation and bone spur development (osteophytes) can lead to stiffening of the joint and limited motion. This condition is diagnosed by careful clinical examination, physical exam, range of motion assessment, and imaging studies like X-rays or MRI scans that visualize cartilage loss, narrowing of the joint space, and osteophyte formation. In some cases, synovial fluid analysis might be done to distinguish osteoarthritis from inflammatory arthritis conditions. Treatment for osteoarthritis of the shoulder is directed at decreasing pain, enhancing function, and retarding disease progression.

Conservative management options involve physical therapy to improve mobility and strength, use of nonsteroidal anti-inflammatory drugs (NSAIDs) to ease pain, and corticosteroid injections to decrease inflammation within the joint. In cases where conservative interventions fail to yield relief, surgical procedures like joint resurfacing or total shoulder arthroplasty (replacement) may be warranted. In addition, lifestyle changes become central to symptom control, such as weight control to minimize joint stress and avoidance of repetitive or undue stress on the shoulder. Through the recognition of the pathophysiologic basis and risk factors of shoulder osteoarthritis, patients and clinicians can collaborate to develop sound management plans to enhance quality of life and preserve functional independence.

The McKenzie Method can be useful for the management of osteoarthritis (OA) of the shoulder, especially in the relief of pain and limitation of mobility. Although classically linked to spinal disorders, McKenzie's philosophy is based on mechanical diagnosis and therapy, which can be translated to shoulder OA by discovering movement patterns which reduce pain and enhance function.

For the patient with shoulder OA, McKenzie-based exercise is based on repetitive motion to restore the mobility of the joint and decrease stiffness. Shoulder extension, adduction, and controlled rotation can be included in the exercises, as they may centralize the pain and improve range of motion. Postural correction and self-management are also important in preventing the joint from further deterioration.

Evidence indicates that organised movement-oriented interventions like the McKenzie Method can supplement traditional OA therapies with active patient engagement and diminished use of passive therapies. That said, it is crucial to individualise exercises and refer to a professional physiotherapist for ensuring correct application of McKenzie principles to shoulder OA management.

Traditional physiotherapy is significant in osteoarthritis (OA) of the shoulder management, addressing pain, increasing mobility, and promoting joint function in general. This is normally combined with manual therapy, therapeutic exercises, and modalities like heat or cold application to reduce symptoms and retard

disease progression.

Physiotherapy for shoulder OA will typically start with a test of joint mobility, muscle strength, and functional restriction. From these findings, an individualized treatment program is constructed, including exercises designed to restore range of motion and strengthen the supporting musculature. Passive and active stretching, resistance training, and proprioceptive exercises to enhance joint stability are common interventions. Joint mobilization is a manual therapy technique used to decrease stiffness and promote movement.

Furthermore, modalities such as ultrasound, electrical stimulation, or hydrotherapy can be used by physiotherapists to control pain and inflammation. Patient education is another important element, where the patient is instructed in posture correction, activity modification, and self- management techniques to avoid further degeneration of joints. Evidence bases the benefits of traditional physiotherapy to address pain and function in the treatment of shoulder OA, thus representing an effective non-surgical intervention.

2. Methodology

Study Design

The study will utilize an experimental design to compare the efficacy of McKenzie's Manual Treatment in combination with Conventional Physiotherapy versus Conventional Physiotherapy alone in patients with osteoarthritis of the shoulder. Participants will be randomly allocated into the intervention group (McKenzie's Manual Treatment + Conventional Physiotherapy) or the control group (Conventional Physiotherapy alone).

Participants

The research will enroll patients with shoulder OA, between 40 to 70 years old, from physiotherapy clinics and hospitals. The inclusion criteria will be:

- Clinical diagnosis of shoulder OA by radiographic imaging.

- Experience of pain, stiffness, and functional impairment for a period not less than three months.

- No history of shoulder surgery or corticosteroid injections within the previous six months.

- Capacity to attend physiotherapy sessions. The exclusion criteria will be:
- Neurological disorders impacting shoulder function.

- Past history of fractures or severe trauma to the shoulder.

- People with systemic inflammatory illnesses like rheumatoid arthritis. Intervention
McKenzie's Manual Treatment

The intervention group participants will be given McKenzie-based exercises involving repeated movements that restore mobility to the joints as well as decrease stiffness. The exercises will involve:

- Shoulder extension and adduction movements for centralization of pain.

- Controlled rotational exercises for increasing range of motion.
- Posture corrections to reduce stress on the shoulder joint.

Traditional Physiotherapy

Both groups will receive standard physiotherapy treatment, which includes:

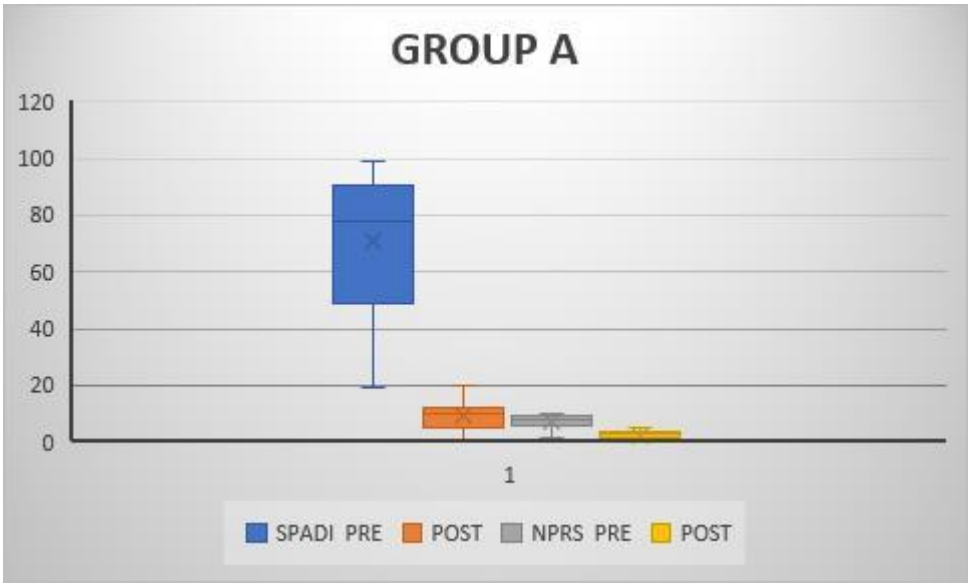
- Passive and active stretching to enhance flexibility.
- Strengthening exercises for the rotator cuff and scapular stabilizers.
- Manual therapy procedures like joint mobilization.
- Pain relief modalities like ultrasound therapy and electrical stimulation. Outcome Measures

The success of the intervention will be measured using the following measures:

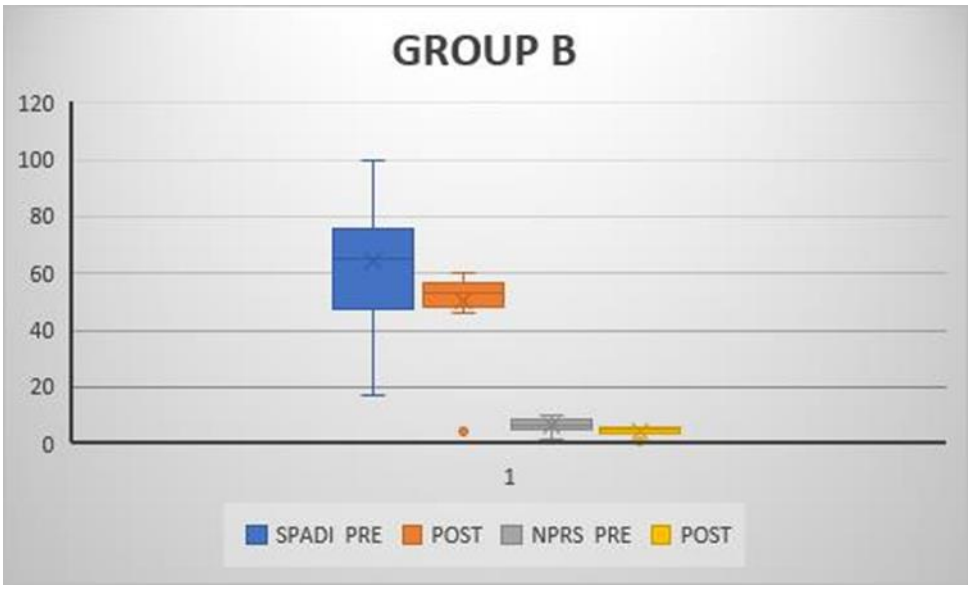
- Intensity of pain (Numerical Pain Rating Scale - NPRS).
- Shoulder function (Shoulder Pain and Disability Index - SPADI).

3. Results

GROUP A							
S. No	OUTCOME MEASURES	PRE TEST		POST TEST		PAIRED T- TEST	
		RANGE	MEAN ± SD	RANGE	MEAN ± SD	T-STAS T	P VALUE
1	SPADI	51-99	74.53±19.2	4-17	10.4±5.10	12.54	5.31×10^{-9} (highly significant)
2	NPRS	6-10	7.86±1.66	1-5	2.86±1.14	8.54	6.36×10^{-7} (highly significant)



GROUP B							
		PRE TEST		POST TEST		PAIRED T- TEST	
S. No	OUTCOME MEASURES	RANGE	MEAN ± SD	RANGE	MEAN ± SD	T-STAST	P VALUE
1	SPADI	50-100	67.2±17.44	46-50	53±4.32	2.85	0.0128 (significant)
2	NPRS	5-10	7.2±1.64	4-9	5±0.81	5.6	6.54×10^{-5} (highly significant)



In this research, two intervention methods were compared for their effectiveness with SPADI (Shoulder Pain and Disability Index) and NPRS (Numerical Pain Rating Scale) as outcome measures in Group A and Group B.

Group A experienced a significant improvement after intervention. The SPADI scores fell significantly

from a pre-test mean of 74.53 ± 19.2 (range: 51–99) to 10.4 ± 5.10 (range: 4–17) in the post-test, with a paired t-test value of 12.54 and a p-value of 5.31×10^{-9}, reflecting a highly significant improvement in shoulder pain and disability. Equally, the NPRS scores were reduced from the pre-test mean of 7.86 ± 1.66 (range: 6–10) to a post-test mean of 2.86 ± 1.14 (range: 1–5), with a t-value of 8.54 and p-value of 6.36×10^{-7}, which was also highly significant. This indicates that the intervention procedure utilized in Group A was highly effective in pain and disability reduction.

In Group B, improvements were also seen but with less magnitude compared to Group A. SPADI scores fell from a pre-test mean of 67.2 ± 17.44 (range: 50–100) to a post-test mean of 53 ± 4.32 (range: 46–60), with t-value 2.85 and p-value 0.0128, reflecting a statistically significant but less marked improvement. For NPRS, the scores decreased from a pre-test mean of 7.2 ± 1.64 (range: 5–10) to a post-test mean of 5 ± 0.81 (range: 4–9), with t = 5.6 and p =
6.54×10^{-5}, which is very significant.

Collectively, both groups showed statistically significant improvement, but the intervention that was given to Group A had a better effect, as seen through larger decreases in SPADI and NPRS scores and significantly lower p-values.

The current study sought to compare the effectiveness of McKenzie's Manual Treatment with Conventional Physiotherapy versus Conventional Physiotherapy with patients suffering from shoulder osteoarthritis. The results showed that both treatments registered notable improvements in pain as well as shoulder function, but McKenzie's techniques proved to have better outcomes when used in combination.

The significant decrease in SPADI scores for Group A (from 74.53 ± 19.2 to 10.4 ± 5.10) indicates a highly significant reduction in shoulder pain and disability after the combined intervention. In the same manner, NPRS scores also significantly reduced, signifying lower pain levels. The lesser yet significant improvement in Group B shows the effectiveness of the traditional physiotherapy independently, as shown by prior literature evidencing its efficacy in the management of shoulder osteoarthritis (Kirkwood et al., 2013).

The improved outcomes in the intervention group are consistent with previous research highlighting the advantage of manual therapy methods. For instance, Luque-Suarez et al. (2018) identified that manual therapy, comprising joint mobilizations and manipulations, notably improves shoulder range of motion and pain in osteoarthritis patients. In addition, McKenzie-based exercises are designed to restore range of motion and diminish stiffness through repeated motions, which have been found to encourage joint centralization and functional recovery in musculoskeletal conditions (McKenzie, 2003). The incorporation of posture correction may also have played a role in minimizing mechanical stress on the shoulder joint, allowing for improved pain control.

The findings concur with current evidence that exercise programs supplemented with manual therapy produce superior clinical outcomes than either intervention in isolation (Hansen et al., 2020). A systematic review conducted by Schenk et al. (2019) indicated multimodal physiotherapy treatments integrating manual therapy maneuvers better alleviated shoulder pain and functioning compared to normal care.

Although both groups showed improvement, the effect size in the combined group highlights the additive

effects of McKenzie's manual treatment. The larger decrease in intensity and disability of pain can be explained by increased joint mobility, reduced mechanical stress, and facilitation of neuromuscular control, as proposed in previous research (Furlan et al., 2015).

Limitations of this study include a relatively small sample size, short-term follow-up, and potential variability in patient adherence to exercises. Future research should include larger cohorts and examine long-term effects to confirm the sustainability of improvements.

In summary, the results favor that McKenzie's manual therapy, in conjunction with standard physiotherapy, provides better advantages in decreasing pain and enhancing shoulder function in osteoarthritis patients. Incorporating manual therapy into routine care modalities could improve clinical results for these patients.

Conclusion

This trial shows that the application of McKenzie's Manual Treatment plus Conventional Physiotherapy results in significantly larger improvements in pain decrease and shoulder function among patients with osteoarthritis of the shoulder than Conventional Physiotherapy alone. The findings indicate that the inclusion of manual therapy procedures has the potential to reinforce the effectiveness of traditional rehabilitation regimes, providing a hopeful strategy for improved control of osteoarthritis of the shoulder. Further research with larger sample sizes and long-term follow-up is advisable to confirm these results and determine the maintenance of benefits.

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