COMPARISON OF SUSTAINED AND INTERMITTENT MANUAL TRACTION IN KNEE OSTEOARTHRITIS

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ABSTRACT

Background: Osteoarthritis (OA) is a main cause of musculo-skeletal pain, relevant cause of handicap and disability from arthritis, and a significant community health care burden, in lost time at work and early retirement.

Objective: To compare the effects of sustained and intermittent manual traction in knee osteoarthritis.

Methods: A randomized controlled trial study conducted in the Department of Physical therapy at Basharat Medical Hospital, Rawalpindi. Total 30 patients participated from both gender with age ranges from 45-70 years diagnosed with knee osteoarthritis placed into two groups. Group (A) treated with sustained manual traction and group (B) by intermittent manual traction. The pain and knee ROM were assessed before and after treatment of 4 weeks through Numeric Pain Rating Scale (NPRS) and Goniometry respectively while functional and stiffness index was assessed through Western Ontario and McMaster Universities (WOMAC) questionnaire. Data was analyzed on SPSS 21.

Results: All the 30 patients completely followed the study. The overall mean age of the participants was 57.83± 7.702 years. The results shows that patients in Group A improves pain (mean NPRS from 8.13 to 2.93) and WOMAC Index Physical functional (mean WOMAC PF from 38.20 to 29.3) more than Group B with pain (mean NPRS from 7.87 to 4.20) and WOMAC Index Physical Functional (mean WOMAC PF from 36.67 to 30.20).Sustained Manual traction statistically showed great effect on decreasing pain and WOMAC Index Physical Function as p value was <0.05. While for WOMAC stiffness index and Knee ROM showed non-significant improvement between the groups as p value was >0.05.

Conclusion: Patients treated with Sustained manual traction have effective improvement in pain and WOMAC Physical function as compared to intermittent manual traction.

Keywords: Osteoarthritis, Sustained Manual traction, intermittent manual traction

I. INTRODUCTION

Osteoarthritis (OA) is described by OA Research Society International: “an ailment which affects the mobile joints composed of cell stress and extracellular matrix deprivation due to minor and major injury that trigger the
pro inflammatory process. After molecular derangement anatomic and physiological derangements occur categorized as cartilage degradation, osteophyte formation, joint swelling and decreased in joint action” (1).

It is a cluster of syndromes having same biological, morphological and clinical effects. The process of degeneration starts from the erosion of cartilage which ultimately cause inflammation and decrease joint space (2). As the disease progresses functional limitation occurs this affects daily living activities (3). Usually it affects the lower limb joints mainly hip and knee (4). Osteoarthritis is of two types namely: primary & secondary osteoarthritis.

Primary OA associated with age. As the age increases water content decreases which makes the cartilage vulnerable to deprivation. Secondary osteoarthritis specific to injury or due to activities like squatting can occur in earlier ages. As the causes are different but complaints are same of pain and decrease in joint mobility. With the increase in activity pain becomes worsened and pleased with rest. If disease left untreated patients feel pain in rest that awakes them from sleeping. From all the cases of OA 60% present with the genetic factor (5).

In terms of disability OA is the fourth in number mostly involving hip and knee joints. OA is mostly seen in Asian region because of speedy ageing it is also found in rural areas because of strenuous physical activities (6).

In people of aged 60 or above 13% are women and 10% are men complaints knee OA with its specific symptoms. From the people of above age 55, 25% shows constant knee pain throughout the year and from them every one patient out of six come to general physician while 10% have restrictive knee pain from which one quarter of people shows loss in functional ability. Women of age more than 55 are more prone to knee OA than men (7).

There is no specific cause of OA but some risk factors like age, female gender and sports related activities involved in Knee OA (8). With the increase in age number of people with OA increases specially in developing countries where people lives with greater lifespan and has no joint proper management (9).

Currently, there is no treatment for Osteoarthritis, because overall mechanism of progression of this disease was not completely understood. Consequently, treatment goals of this disease are to improve the signs and symptoms, as a result to slow down the progression of disease. General measures for broad spectrum ranges from physical therapy, orthoses, pharmacotherapy, surgery, orthopedic aids and rehabilitation.

“The best treatment for knee osteoarthritis is prevention”. Mohig et al. stated (10).

To access the severity of knee joint OA conventional radiography is use in clinical practice. So far, the best imaging modality in knee OA assessment is magnetic resonance imaging (MRI) (11).

Kellgren Lawrence (KL) gives the classification of knee OA on the basis of severity by radiographic measures.

- Grade 0; Normal
- Grade 1; Signs of abnormality
- Grade 2; Mild OA “definite osteophytes”
- Grade 3; Moderate OA “joint space reduced”
- Grade 4; Severe OA “subchondral sclerosis”

This grading is used for proper diagnosis and management of OA (12).

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According to, Evidence Base Specialist Agreement Guidelines of Osteoarthritis Research Society International (OARSI), recommends that referring patients to physical therapist shows positive results on physical functions,
so effect of manual physical therapy including joint manual mobilization is a good treatment option (Zhang et al 2008). Combination of exercise therapy with passive joint mobilization shows positive results in improving physical function and treating joint impairments. Passive manual joint mobilization includes oscillation mobilizations, soft tissue mobilization in order to improve joint stability, joint mobility and reduction of pain. Limited joint mobility, particularly knee flexion is considered to be significantly definitive of disability in knee osteoarthritis (14).

This purpose of this study was to see the effect of sustained manual traction and intermittent manual traction on pain, quality of life and knee ROM in patients with knee OA.

II. METHODS AND METHODOLOGY

The ethical review committee of Riphah College of Rehabilitation Sciences Islamabad and Basharat medical hospital approved to conduct this study. This was a randomized controlled trial

conducted from June 2018 to November 2018 at outpatient department of Physical therapy and Rehabilitation, Basharat medical hospital Rawalpindi. Patients with age 45-70 years of both genders, radiological diagnosed with osteoarthritis were included in this study while patients with rheumatological conditions, recent fractures around knee and previous knee surgeries were excluded from the study. Informed consent was taken from all participants fulfilling the inclusion criteria. Sample size was calculated by openEpitool with confidence level 95%. Selected participants were divided into two treatment groups by lottery method. Conventional treatment is given to both groups while group A treated with sustained manual traction and group B with Intermittent manual traction.

In conventional treatment TENS and hotpack was applied for 15 minutes while for traction patient was in prone lying position with anterior side of the thigh on treatment surface. While position the patients knee in its resting position. Therapist was standing along the treatment surface and hold patients thigh alongside the treatment surface and placed palpating finger in joint space. With moving hand therapist hold the patients leg at above the ankle, and positions his forearm aligned with the patient lower leg. Apply a Grade I, II, or III traction movement in line with the lower leg. In group A Sustained Traction was applied for 6 minutes while in group B intermittent traction was applied continuously for 6 minutes with 30 sec hold and 10 sec rest. Structured questionnaire was used. Data was collected before and after completion of 4 weeks treatment protocol by 3 sessions per week. Pain intensity was measured with Numeric Pain Rating Scale and quality of life was assessed by Western Ontario and McMaster Universities (WOMAC) questionnaire whereas limitation of Range of motion was measured by Goniometer. Data was then analyzed on SPSS 21. Non-parametric tests i-e Wilcoxon signed Rank test and Mann-Whitney Test were applied on NPRS, WOMAC index stiffness, WOMAC index physical function and on all the knee ranges.

III. RESULTS.

Patients were recruited from June 2018 to November 2018. Total 40 patients were assessed for knee OA; only 30 patients met the inclusion criteria, 15 patients in Sustained group (Group A) and 15 in intermittent group (Group B). 1 patient from Group A and 1 patient from Group B were drop out as they did not come for follow up. 14 patients in group A and 14 in group B were analyzed for further study. Demographics variables like age and gender are reported in Table-1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Study population (n=28)</th>
<th>Group A (n=14)</th>
<th>Group B (n=14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age mean±SD</td>
<td>57.83± 7.702</td>
<td>58.93± 8.362</td>
<td>56.73± 7.096</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11(36.7 %)</td>
<td>6(46.7 %)</td>
<td>4(26.7 %)</td>
</tr>
<tr>
<td>Female</td>
<td>17(63.3 %)</td>
<td>8(53.3 %)</td>
<td>10(73.3 %)</td>
</tr>
</tbody>
</table>

Within group difference showed significant results but when across the group analysis was done, Group A improves pain (mean NPRS from 8.13 to 2.93) and WOMAC Index Physical functional (mean WOMAC PF from 38.20 to 29.3) more than Group B with pain (mean NPRS from 7.87 to 4.20) and WOMAC Index Physical Functional (mean WOMAC PF from 36.67 to 30.20). Sustained Manual traction statistically showed great effect
on decreasing pain and WOMAC Index Physical Function as \( p \) value was <0.05. While for WOMAC stiffness index and Knee ROM showed non-significant improvement between the groups as \( p \) value was >0.05. Table-2

<table>
<thead>
<tr>
<th>Variables</th>
<th>Groups</th>
<th>Pre</th>
<th>Post</th>
<th>( P )-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPRSmean±SD</td>
<td>Group A</td>
<td>8.13± 0.743</td>
<td>2.93± 0.79</td>
<td>0.001</td>
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<tr>
<td></td>
<td>Group B</td>
<td>7.87± 0.743</td>
<td>4.20± 0.94</td>
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<tr>
<td>WOMAC index</td>
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<tr>
<td>Physical function</td>
<td>Group A</td>
<td>38.20± 8.428</td>
<td>2.93± 7.75</td>
<td>0.026</td>
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<tr>
<td>mean±SD</td>
<td>Group B</td>
<td>36.67± 8.482</td>
<td>3.20± 9.11</td>
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</tr>
<tr>
<td>WOMAC index</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stiffness mean±SD</td>
<td>Group A</td>
<td>4.20± 0.941</td>
<td>2.00± 0.92</td>
<td>0.384</td>
</tr>
<tr>
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<td>Group B</td>
<td>5.20± 1.082</td>
<td>2.47± 1.40</td>
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<tr>
<td>Flexion ROM</td>
<td>Group A</td>
<td>99.53±26.811</td>
<td>112.87± 10.67</td>
<td>0.771</td>
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<td>Group B</td>
<td>105.60±10.43</td>
<td>113.47±10.38</td>
<td></td>
</tr>
<tr>
<td>Extension ROM</td>
<td>Group A</td>
<td>3.77±1.486</td>
<td>1.07± 0.88</td>
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<tr>
<td></td>
<td>Group B</td>
<td>2.47±1.642</td>
<td>1.07± 1.22</td>
<td>0.744</td>
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</tbody>
</table>

IV. DISCUSSION

This study was conducted to determine the effects of sustained and intermittent manual traction on pain, quality of life and knee ROM in patients with knee osteoarthritis. Both groups showed improvement in quality of life, pain and knee ROM but sustained group showed more significant improvement for pain and for WOMAC index physical function \( p \)<0.05.

A randomized controlled study conducted by Gail D. to determine the effects of physical therapy on knee Osteoarthritis patients. 83 patients were randomly divided in to 2 groups. Interventional group received manual therapy treatment and other group received placebo had sub therapeutic ultrasound. Participants were treated for 4 week, 2session/week. Result shows significantly improvement in WOMAC score and six min walk test in treatment group. It was concluded that manual therapy and exercises shows functional improvements for knee osteoarthritis patients. Combine physical therapy and exercises provides functional improvements in osteoarthritis of knee and delays the need of surgical intervention (15). In my research, results depict that patients treated with sustained manual traction have effective improvement in pain and physical functional status, on WOMAC, as compared to intermittent manual traction.

A prospective study conducted by Şenay Özdolap to examine the outcome of traction on knee osteoarthritis.34 patients were included, group A was treated with hot pack, microwave, traction and isometric exercises while group B received isometric exercises, microwave and hot pack for 15 minutes. Result shows significant decrease in VAS and Lequesne Functional Index in traction group. It was concluded that traction has positive effects on decreasing pain and improve functional status on knee OA patients (16).

A study conducted by somayef Mahmoudi et al reported, that conventional physiotherapy along with distraction shows significant improvement in functional status and quality of life as compared to conventional physiotherapy alone in severe knee osteoarthritis patients (17).

V. CONCLUSION

Patients treated with sustained manual traction have significant improvement in pain and physical functional status as compared to intermittent manual traction.

LIMITATIONS

This study was done on small population due to limited number of patients referred from OPDs.
Limited sessions were given due to short time duration of study. Poor referral system of patients from hospital OPD’s.

REFERENCES
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