International Journal of Science and Research (IJSR)
ISSN: 2319-7064
ResearchGate Impact Factor (2018): 0.28 | SJIF (2019): 7.583

Study to Show the Combination of Knee Traction, Lateral Glides of Knee and Quadriceps Strengthening Shows Effective Recovery from Pain in Osteoarthritis Knee

Dr Sahitya Deepak Maddela

Chief Physiotherapist, Sri Sarojini Physiotherapy & Stroke Rehab Clinic, Kakinada, AP, India

Abstract: ***Quadriceps Strengthening is one of the key tool used for rehabilitation of knee joint pain. The term connotes knee stabilization, motor control training and other regimens. Knee traction and lateral glides along with quadriceps strengthening, shows tremendous result in reducing the joint pain and improve the quality of living in many individuals. Despite of quadriceps strengthening, the knee traction and lateral glides has been promoted as a preventive regimen, as a form of rehabilitation, and as a performance – enhancing program for various degenerative conditions of knee.***

Keywords: Quadriceps Strengthening, Knee Traction, Lateral Glide of knee, degenerative knee

1. Overall Objective of the Study

To understand the concept of Knee traction, lateral glides of knee along with quadriceps strengthening of knee will reduce the pain and improve the quality of living in osteoarthritis knee

2. Result

The interventions ranged for 3 weeks / 21 days. Total 10 subjects with different gender and age whose main complaint is knee pain with degenerative changes were selected. The treatment regime for 1st week is purely knee traction and lateral glides which improve the joint range of motion, after 1st week the quadriceps strengthening is also included along with traction and lateral glides of knee joint. So after overall 21 days of treatment the 10 subjects have shown tremendous results whose pain has been reduced from Visual Analogue Scale (VAS) 8-10 to 1-2. This combination therapy program achieved positive statistically significant results between the baseline and the follow-up quantitative measurements.

3. Conclusion

After the period of 3 weeks / 21 days of treatment the subjects showed a positive result in reducing their pain and they can perform regular activities then before. The joint play and range of motion have increased which resulted in pain free movement which in turn improved the quality of living of every individual. There are some subjects who have prepared for Knee Replacement surgery, even they are successfully treated and leading a happy life.

4. Methods & Methodologies

4.1 Review of literature:

1) Centres for Disease Control and Prevention (CDC). Prevalence of disabilities an associated health Conditions among adults—United States, 1999. Morb talWklyRep., 2001;50(7):1205.11393491.http:// www.mercksource.com/pp/us/cns/cns_hl_dorlands_split.jsp?pg=/ppdocs/us/common/dorlands/dorland/six/000076356.htm) ¯at Dorland's Medical Dictionary
2) Marlene Fransen, Lisa Bridget, Lyn March, Peter Brooks. The epidemiology of osteoarthritis in Asia. International journal of Rheumatic Diseases. 2011;14(2):113-121.
3) Susan B O'Sullivan and Thomas Schmitz. Textbook of Physical rehabilitation- 5th edition 1067-1068.
4) Antony Antony Leo Aseer et al. Effectiveness of Manual traction Of tibio-femoral Joint on the functional outcome in kneejoint osteoarthritis.Indian Journal of PhysicTherapy 2014;2(1):56-61.
5) Deyle GD, Allison SC, Matekel RL, Ryder MG, Stang JM, Gohdes DD, et al. Physical Therapy Treatment Effectiveness for Osteoarthritis of the Knee: A Randomized Compariso of Supervised Clinical Exercise and Manual Therapy Procedures Versus a Home Exercise Program. Phys Ther 2005;85:1301-17.
6) F) Roddy E, Zhang W, Doherty, M, Arden NK, Barlow J, Birrell F, Carr A, et. al Evidence-based recommendations for the role of exercise in the management of osteoarthritis of the hip or knee- the MOVE consensus. Rheumatology 2005; 44 67-73.
7) Zeng C, Li H, Yang T, Yang Y. Effectiveness of continuous and pulsed ultrasound for the management of knee osteoarthritis: a systemic review and network meta-analysis. Osteoarthritis Cartilage 2014; 22: 1090-1099.

4.2 Aim of the Study

The primary aim of this study is to prove that this type of exercise protocol can efficiently beneficial to the subjects suffering with Severe Osteoarthritis of Knee.

4.3 Objectives

The main objective of the study is to reduce chronic knee pain, analyze the results by using The WOMAC (Western Ontario and McMaster Universities) index is used to assess patients with osteoarthritis of knee using 24 items, (VAS) visual analogue scale and angulations of joint is studied with goniometer.

Assessment Tools:
a) WOMAC SCALE
b) VAS SCALE
c) GONIOMETER

4.4 Methodology

a) **Research Design –** The design which is used in the study is the Quasi Experimental Design
b) **b)Study Setting –** The study was conducted at Sri Sarojini Physiotherapy & Stroke Rehab Clinic, Kakinada, Andhra Pradesh.

10 subject with different genders and age who are suffering with severe knee pain have been selected. Their X-rays showed severe degenerative changes and their range of motion are also reduced, due to pain and arthritic changes.

Inclusive Criteria
a) Clinically diagnosed as chronic knee pain for more than 8 weeks.
b) Those who are willing to participate in the study and willing to take treatment for 3 weeks
c) Who's pain is only due to arthritis of knee
d) All genders and age below 65

Exclusive Criteria:
a) Subjects suffering with infective conditions because it could spread the infection or exacerbate due to the stimulatory effects of current
b) Subjects with malignant tumors
c) Subjects with large open wounds
d) Those who have a history of ligament and menisci injuries to the effected leg
e) Those who have any surgical correction of ligaments and menisci to the effected leg
f) Subjects with osteoporosis

Parameters:
a) WOMAC Scale
b) Visual Analogue Scale (VAS)
c) Goniometry

WOMAC Scale
The Western Ontario and McMaster Universities Arthritis Index (WOMAC) is widely used in the evaluation of Hip and Knee Osteoarthritis. It is a self-administered questionnaire consisting of 24 items divided into 3 subscales.

- Pain (5 items): during walking, using stairs, in bed, sitting or lying, and standing upright
- Stiffness (2 items): after first waking and later in the day
- Physical Function (17 items): using stairs, rising from sitting, standing, bending, walking, getting in / out of a car, shopping, putting on / taking off socks, rising from bed, lying in bed, getting in / out of bath, sitting, getting on / off toilet, heavy domestic duties, light domestic duties

VAS Scale
0-1-2-3-4-5-6-7-8-9-10
1 to 2 – Annoying pain
3 to 4 – Uncomfortable pain
5 to 6 – Dreadful pain
6 to 8 – Horrible pain
9 to 10 – Agonizing pain

Goniometry
A goniometer measures range of motion of limbs and joints of the body. These measurements help accurately track progress in a rehabilitation program. When a patient has decreased range of motion, a therapist assesses the joint before performing an intervention, and continues to use the tool to monitor progress. They typically require knowledge about the anatomy of the body, particularly bony landmarks. For example, when measuring the knee joint, the therapist places the axis (point of rotation) on the lateral epicondyle of the femur, and lines up the stationary arm with the greater trochanter of the femur. Finally, the therapist lines up the moveable arm of the goniometer with the lateral malleolus of the fibula, and records a measurement using the degree scale on the circular portion of the tool.

Exercise Program

Quadrecips Strengthening:
The following exercises are recommended as mandatory exercise protocol for strengthening of quadriceps muscles.
1) Isometrics
2) Straight leg raise with gradual increase in sand bag weights
3) Half Squats
4) Exercises with tera band
5) Leg raise in side lying with weights

Radiological Presentation:
X-ray of a subject who has undergone the treatment in our Clinic is attached below. It shows how significant changes in the knee joint took place, before and after the course of treatment.

Before Treatment

After Treatment

There is a significant improvement of Joint Range of Moment and the quality of life of the subject has improved in such a way that he/she has regained confidence and led a pain free life after the course of treatment

5. Data Presentation

Table 1: Data presentation of pain – before and after the treatment

S No	1	2	3	4	5	6	7	8	9	10
Before	8	7	9	8	7	9	10	9	9	8
After	2	1	2	2	1	1	2	1	2	2

Table 2: Data Presentation of Joint Range of Motion – Before and After Treatment

S No	1	2	3	4	5	6	7	8	9	10
Before	68^0	65^0	58^0	72^0	76^0	60^0	57^0	61^0	64^0	70^0
After	98^0	100^0	95^0	94^0	108^0	93^0	99^0	100^0	110^0	100^0

Table 1

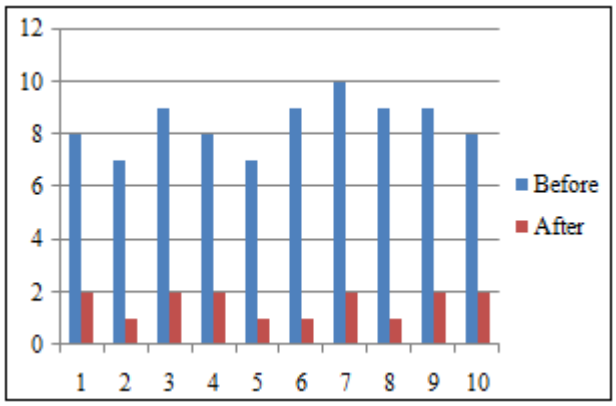
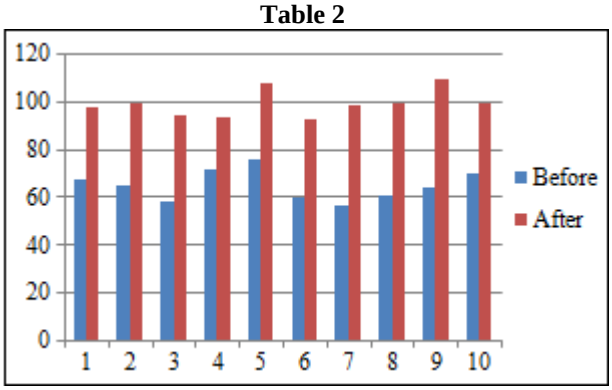
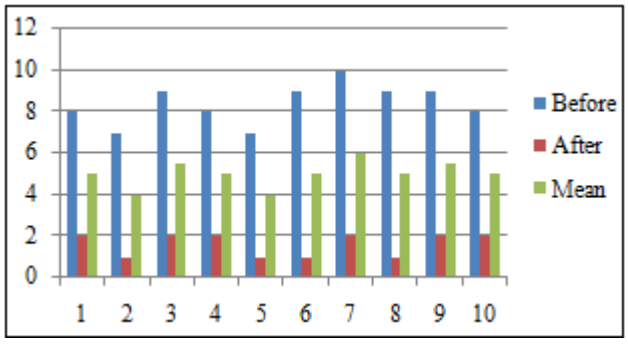


Table 2



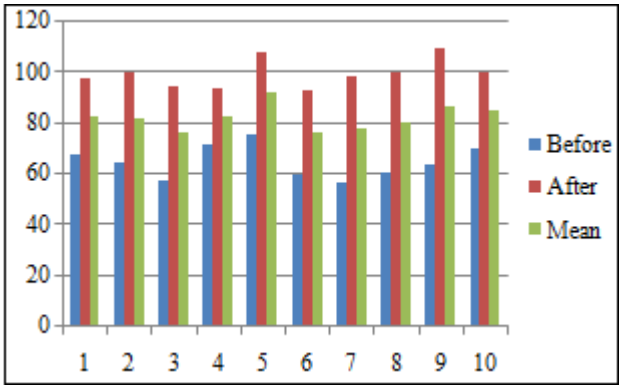
Mean Values for Table -1

S.No	1	2	3	4	5	6	7	8	9	10
Before	8	7	9	8	7	9	10	9	9	8
After	2	1	2	2	1	1	2	1	2	2
Mean	5	4	5.5	5	4	5	6	5	5.5	5



Mean Value for Table -2

S.No	1	2	3	4	5	6	7	8	9	10
Before	68º	65 º	58 º	72 º	76 º	60 º	57 º	61 º	64 º	70 º
After	98 º	100 º	95 º	94 º	108	93 º	99 º	100 º	110 º	100 º
Mean	83 º	82.5 º	76.5 º	83 º	92	76.5 º	78 º	80.5 º	87 º	85 º



6. Discussion

- During the 1st phase of treatment, mainly on the 4th – 5th day each subject said that they feel little comfort while walking than the pre-treatment
- Once the exercise session was started they have felt a great difference when compared with the beginning days of treatment.
- After completing 2 weeks of treatment I have asked everyone to have x-ray in order to check the joint space. Out of 10, 7 subjects x-rays showed that there is quite improvement in gained joint space.
- This results in improvement in joint play and activity
- After complete 3 weeks of treatment each subject has showed a positive response, they are pain free and developed confidence in walking, stair climbing and jogging.

7. Conclusion

This treatment protocol is first of its kind showing tremendous results in reducing chronic knee pain. Knee traction along with lateral glides promote excellent result in increasing the joint space and promote the ease in joint play, resulting in reducing the knee pain and improvement in walking. The combination of strengthening exercises will stand as a base for the knee traction and lateral glides. The exercise will develop the strength in the thigh muscles that directly helps in gaining good balance and support while walking. This three week treatment protocol should be recommend to every patient who want to undergo knee replacement surgery, in my opinion only the final stage of degenerative arthritis patient needs surgery remaining percentage of patients who are at 2nd stage or 1st stage of degenerative knee will be beneficial from this treatment protocol and will be free from surgery.

8. Recommendation

I strongly recommend that concentrating only on Quadriceps will gain the stability of the knee joint but for further improvement I recommend atleast 45 days home rehabilitation program which include strengthening of all the muscles of thigh and calf for healthy knee joint. The exercise protocol for home rehabilitation depends on therapist to therapist. In my clinic, I suggest the subjects to visit weekly once for the review after the 21 days treatment protocol. I will recommend different exercises to them so that they can do at their own at their places.