THE EFFECT OF TRACTION IN KNEE OSTEOARTHRITIS: AN EVIDENCE BASED STUDY

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ABSTRACT:

Objective — To determine effectiveness of traction in knee osteoarthritis. **Design—** The articles were searched in Google scholar, Pubmed, Elsevier, Cochrane library by using keywords traction, knee osteoarthritis. Articles which were done during the year 2000 - 2019 were only selected. Articles were selected only if they were randomized controlled trial, includes subject with knee OA, Pain and activities of daily living were used as one of the outcome measure. **Results—**60 to 65 articles were searched from different database out of them 11 articles were selected for the study. Two reviewers assessed study using the PEDro scale. Data were extracted by two reviewers that includes the intervention description, inclusion/exclusion criteria, baseline data, values for all outcomes at baseline, post-intervention and follow-up. **Conclusion—**Our findings indicate that the intermittent mechanical traction with knee 90° flexion with traction force 1/7th of body weight and 30:10 seconds for 1 week is effective.

Keywords

Knee osteoarthritis; Traction; Pain; Activities of daily living

INTRODUCTION:

Knee osteoarthritis (OA) is also known as degenerative joint disease. It is typically the result of wear and tear and progressive loss of articular cartilage. It is most common in elderly women & men. Knee osteoarthritis most commonly affects women than men after the age of 50 years. The most common cause of knee OA is age and other causes are weight, heredity, gender, repetitive stress injury, athletics, muscle weakness and imbalance, occupation [prolong standing & repetitive knee bending]. Common clinical symptoms include knee pain, stiffness, swelling, decrease functional range of knee and pain worsen with activity.

Treatment for knee OA begins with conservative methods and progress to surgical treatment option when conservative treatment fails. Conservative treatment option includes patient education, activity modification, physiotherapy, weight loss, knee bracing, Non-steroidal anti-inflammatory drugs and intra-articular injection. Operative management ranges from osteotomy to joint replacement.

Physiotherapy management involves exercise therapy as well as electrotherapy as a part of treatment. Electrotherapy modalities such as Interferential therapy, Transcutaneous electrical nerve stimulation, ultrasound, hotpacks, short wave diathermy, LASER, manual & mechanical knee traction, Exercise therapy includes Quadriceps setting exercises, strengthening and stretching exercises, tapping, joint mobilizations.[1]

Movement due to traction assists circulation and decreases concentration of noxious irritants. Mechanical stretching of tight tissue should increase the mobility of the segment, thus decreasing pain from restricted movement or strain on tight tissues. Stimulation of mechanoreceptors blocks transmission of pain and inhibition of reflex muscle guarding decreases discomfort in muscles.[2]

Evidence based study is needed to determine effective treatment and document the therapeutic effect of different modalities and techniques. Thus there is a need to determine effectiveness of traction in knee osteoarthritis.

METHOD:

Search strategy and study selection - The articles were searched in Google scholar, Pubmed, Elsevier, Cochrane library by using keywords traction, knee osteoarthritis. Articles which were done during the year 2000 - 2019 were only selected. Two reviewers identified titles and abstracts relevant to using traction in patients with knee OA. Full texts of the published articles and unpublished articles were included. Articles were selected only if they were randomized controlled trial, includes subject with knee OA, Pain and activities of daily living were used as one of the outcome measure. Articles were excluded if they were Cor-relational study or Case study

Study selection: 60 to 65 articles were searched from different database out of them 11 articles were selected for the study.

Quality measurement: Two reviewers assessed study using the PEDro scale. Data were extracted by two reviewers that includes the intervention description, inclusion/exclusion criteria, baseline data, values for all outcomes at baseline, post-intervention and follow-up

RESULT:

Sr. No.	Title	No. of subjects	Study Design	Duration	Outcome Measure	Result	PEDRO Score
1	Effectiveness of manual traction of tibiofemoral joint on the functional outcome in knee joint OA[3]	40 patients 20 patients [control group] 20 patients [experimental group]	Single blinded Randomized Controlled Trial	2 weeks	Pain[VAS] active knee flexion range of motion KOOS [knee injury and OA outcome score]	Significant improvement in experimental group compared to control group in terms of pain, subscale of KOOS and moderate improvement in active knee flexion range	8/11
2	Effect of mechanical traction in osteoarthritis knee[4]	50 patients 25 patients [control group] 25 patients [experimental group]	———	1 week	WOMAC	Both the groups showed improvement but there was significant improvement on WOMAC scale in group treated with mechanical traction, US, exercise.	9/11
3	Effect of mechanical traction on pain and function in subject with OA knee[5]	24 patients 12 patients [control group] 12 patients [experimental group]	Experimental study	1 week [5 days]	NPRS [pain] Functional lequesne index [LI]	Mechanical traction is more effective in reducing pain and improving physical function in subject with OA knee.	8/11
4	Effect of traction therapy in knee OA : a prospective controlled study[6]	43 patients 24 patients [experimental group] 19 patients [control group]	Prospective controlled study	15 session	ROM [goniometry] Pain[VAS] Functional lequesne index	Significant decrease in VAS [rest and motion], and LI index in traction group.	6/11
5	A randomized trial on the efficacy of intermittent and continuous traction for patient with knee OA[7]	90 patients 30 patients [control group] 30 patients [intermittent group] 30 patients [continuous group]	Randomized controlled study	3 week and follow up at 7 week	WOMAC, VAS, Goniometry-knee ROM	Joint traction was found to be beneficial for improvement of pain and physical functional loss related to OA knee. Continuous more effective than intermittent	7/11

6	Effect of unloading traction in patient with knee OA[8]	80 patients 40 patients [group A] 40 patients [group B]	Randomized prospective study	6 week	WOMAC	Unloading knee traction in patient with OA knee is beneficial.	6/11
7	The effect of mechanical traction on pain and physical function in patient with knee OA[9]	23 patients 12 patients [group A] 11 patients [group B]	Randomized study	4 week	NPRS & WOMAC	No significant difference was seen among all dependant variance after intervention for 4 week.	5/11
8	Effect of non-surgical joint distraction in the treatment of severe OA knee[10]	40 patients 20 patients [group A] 20 patients [group B]	Randomized controlled trial	10 session	VAS	Knee distraction to standard physiotherapy treatment can result in improvement in pain relief, increase functional ability and better quality of life in patient with severe OA knee.	6/11
9	Effect of joint traction on functional improvement and quality of life in pt. with severe OA knee[11]	40 patients 20 patients [group A] 20 patients [group B]	Clinical trial study	1 month	KOOS[knee injury and OA outcome score]	Knee distraction induced significant improvement in quality of life in patients with severe OA compared to common physiotherapy treatment alone.	6/11
10	Effectiveness of manual traction on pain and ROM in OA of knee[12]	40 patients 20 patients [control group] 20 patients [experimental group]	Experimental comparative study	7 days	VAS & ROM [goniometry]	The range of motion and pain significant improved after manual traction and strengthening in group A compare to group B.	6/11
11	Effect of sustain traction on physical improvement of patients with severe knee OA[13]	40 patients 20 patients [group A] 20 patients [group B]	Clinical trial		Pain- VAS ROM- Goniometry	Common physiotherapy treatment accompanied by knee traction is a more effective treatment than common physiotherapy procedure in patient with severe knee osteoarthritis.	6/11

DISCUSSION

Total 11 articles were reviewed to determine effect of traction on knee osteoarthritis. Traction helps in relieving pain, improves range of motion of knee and improves quality of life of patient.

Joint cartilage is aneural, thus it is known that pain in knee osteoarthritis results from periarticular tissues and intra-articular tissues outside the cartilage. Long axis traction distracts the knee joint and pulls the shortened tissues which temporarily decreases joint compression allowing fluid movement.[3,5] Intermittent traction increases vascular and lymphatic flow that reduces stasis and edema. Further it stimulates proprioceptive reflexes, this further results in pain reduction [4,5]

Out of 11 studies, three studies used intermittent[4,5,6](mechanical) and two studies used Intermittent[3,12](manual) traction. Two studies used continuous traction.[9,10]One study compared the effect of intermittent versus continuous traction and stated continuous traction to be more effective than intermittent.[7] Manual traction requires appropriate skill of the therapist.

Considering position of knee during traction, out of 11 studies four studies used 80° – 90° knee flexion position during traction.[4,9] Two studies used 10°-30° knee flexion reason for this position may be the ligaments and capsule are at their least tension and the distractive force can induce maximum joint separation and unloading effect.[5,10] Two studies gave traction with knees extended.[6,7]

Out of 11 studies, two studies used force 1/7th of body weight.[4,5] Two used 15 kg.[6,7] One used 1/6th of body weight initially then gradually increased in last 2 weeks.[9] And one usedthe lowest load that patients start feeling distraction was used for distraction. [10]

In relation to the application time of mechanical traction all studies on pain and functioning showed significant results. Intermittent traction was given for 20-30 seconds and 10 seconds rest period for 5 – 7 sessions a week.[3,4,5] Continuous traction was given 15 – 20 minutes continuously for 12 – 15 sessions [6,7,9]

CONCLUSION:

It is concluded that intermittent mechanical traction with knee 90° flexion with traction force 1/7th of body weight and 30:10 seconds for 1 week is effective.

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