Clinical Trial Protocol
Iranian Registry of Clinical Trials

22 Nov 2026

Comparison of Effects of Mulligan Techniques and Muscle Energy Technique (MET) on Pain and Function in Knee Osteoarthritis.

Protocol summary

Study aim
compare between the immediate (after first session) and short term (after three sessions) effects of tibio-femoral gliding MWM Mulligan techniques, and hamstring, quadriceps, and tensor fascia latae post isometric Muscle Energy Technique (MET) on Pain, range of motion, and daily functional activities in patients with Knee OA.

Design
randomized clinical trial.

Settings and conduct
baquba teaching hospital- diyala governorate- iraq.

Participants/Inclusion and exclusion criteria
• Patients with Chronic unilateral (preferably) or bilateral (intervention will be to dominant side) knee osteoarthritis (grade II and grade III). • BMI must be ≤ 30.• patients are independently mobile.• Visual Analogue Scale must be ≥4• Knee Extension lack ≥20 degrees• Patients will be in study if they have no concomitant disease affecting the knee, e.g. rheumatoid arthritis, recent injury, and/or surgery to the knee and had received intra- articular corticosteroid during the last 6 months exclusion criteria;• Absent for two or more continuous sessions.• Patients who have pathological fractures, revision surgeries, associated ipsilateral injuries, and neurovascular disorders will be excluded from the study. Patients who are not satisfied to continue the treatment.

Intervention groups
Group A will have mulligan's (lateral, medial, internal rotation and external rotation glides) with knee extension and flexion as well as conventional treatment, and group B will have post isometric relaxation MET of (quadriceps, hamstring and tensor fascia lata muscles) as well as conventional treatment.

Main outcome variables
• The Visual Analogue Scale for pain. • Knee ROM by goniometer. • Timed up and go test (TUG), for evaluation of knee function. • Patients' opinion by Knee Injury and Osteoarthritis Outcome Score (KOOS) Arabic version (Questionnaire).

General information

Reason for update
Acronym
IRCT registration information
IRCT registration number: **IRCT20210121050099N1**
Registration date: **2021-01-25, 1399/11/06**
Registration timing: **registered_while_recruiting**

Last update: **2021-01-25, 1399/11/06**
Update count: **0**

Registration date
2021-01-25, 1399/11/06

Registrant information
Name
abbas taher
Name of organization / entity
Country
Iraq
Phone
+964 21 058 3318
Email address
abasfq@gmail.com

Recruitment status
Recruitment complete
Funding source

Expected recruitment start date
2021-01-19, 1399/10/30
Expected recruitment end date
2021-02-25, 1399/12/07
Actual recruitment start date
empty
Actual recruitment end date
empty
Trial completion date
empty

Scientific title

Comparison of Effects of Mulligan Techniques and Muscle Energy Technique (MET) on Pain and Function in Knee Osteoarthritis.

Public title
Effects of Mulligan and Muscle Energy Techniques on Knee Osteoarthritis.

Purpose
Treatment

Inclusion/Exclusion criteria

Inclusion criteria:
• Patients with Chronic unilateral (preferably) or bilateral (intervention will be to dominant side) knee osteoarthritis confirmed by x-ray, Without ligament pathology or injury (grade II and grade III of Kellegren and Lawrence classification).(50) • patients are independently mobile. • BMI must be ≤ 30. • Visual Analogue Scale must be ≥4 • Knee Extension lack ≥20 degrees • Willingness to participate and follow the treatment schedule. • Patients will be in study if they have no concomitant disease affecting the knee, e.g. rheumatoid arthritis, recent injury, and/or surgery to the knee and had received intra-articular corticosteroid during the last 6 months

Exclusion criteria:
• Absent for two or more continuous sessions. • Patients who have pathological fractures, revision surgeries, associated ipsilateral injuries, and neurovascular disorders will be excluded from the study. Patients who are not satisfied to continue the treatment.

Age
From **35 years** old to **60 years** old

Gender
Both

Phase
N/A

Groups that have been masked
No information

Sample size
Target sample size: **30**

Randomization (investigator's opinion)
Randomized

Randomization description
The simple random allocation technique will be used to distribute those patients into a group of intervention; each subject has the opportunity to choose the intervention group randomly by pick up a small piece of paper out of 30 pieces (15 for MWM and 15 for MET) which contains the assigned interventions.

Blinding (investigator's opinion)
Not blinded

Blinding description

Placebo
Not used

Assignment
Parallel

Other design features

Secondary Ids

empty

Ethics committees

1

Ethics committee

Name of ethics committee
Tehran university medical sciences. Ethics Committee of Nursing Midwifery and rehabilitation.

Street address
enghilab

City
tehran

Province
Tehran

Postal code
65478

Approval date
2021-01-18, 1399/10/29

Ethics committee reference number
IR.TUMS.FNM.REC.1399.179

Health conditions studied

1

Description of health condition studied
chronic knee osteoarthritis

ICD-10 code
M17

ICD-10 code description
Osteoarthritis of knee

Primary outcomes

1

Description
patients' opinion about thier knees

Timepoint
before first session, after third one and 4 weeks after the last session.

Method of measurement
Knee Injury and Osteoarthritis Outcome Score (KOOS) Arabic version (Questionnaire).

Secondary outcomes

empty

Intervention groups

1

Description
Intervention group A: Mulligan mobilization with movement technique, physiotherapy manual exercises technique. 15 subjects in this group will have mulligan mobilization with movement in these different positions (prone and standing), according to pain laterality, plus conventional exercises therapy. I. Subjects suffering from pain or more pain in the lateral aspect of the knee will receive the following intervention each session; 1) lateral

glide mobilization by using belt with active knee extension and flexion in prone position, 3 sets with 6 repetitions for extension and flexion in each set, 30 seconds rest between each set. 2) External rotation glide in standing position. with weight bearing and active knee flexion and extension The intervention continues with three sets of the MWM, of 6 repetitions in flexion and extension each set. 3) conventional knee osteoarthritis exercises; •Quadriceps isometric strengthening exercises; subject lay in supine position. • Straight leg raising exercise. 4) All of subjects will do home exercises program. This program includes conventional exercises such as quadriceps isometric strengthening, straight leg raising, hamstring curls-up and hip abduction exercises. Each exercise is done for 3 sets in each day with 30 repetitions and each repetition will last for 10 seconds muscle contraction period. II. Subjects suffering from pain in the medial aspect of the knee will receive the following intervention;1) medial glide mobilization in prone position by using belt with active knee extension and flexion, 3 sets with 6 repetitions for extension and flexion each set, 30 seconds rest between each set. With similar above procedures. The only difference is the direction of gliding. 2) Internal rotation in standing position with weight bearing and active knee flexion. The same procedure in I 2 with the difference in internal rotation gliding. 3) Conventional knee osteoarthritis exercises; quadriceps isometric strengthening exercises and straight leg raising Home active conventional osteoarthritis exercises.

Category

Rehabilitation

2

Description

Intervention group B: muscle energy manual exercises technique MET. physiotherapy manual exercises technique. 15 subjects in this group will receive Post isometric relaxation of Muscle energy technique as following; I. Quadriceps MET contraction of quadriceps with only 20% of maximum voluntary contraction strength in extension against therapist’s resistance for 7-10 seconds, and followed by patient’s exhalation, the therapist stretches the muscle for 30 seconds. Then a new end position is found and ask the patient to repeat isometric contraction again, repeated this technique for 3-4 times. II.Hamstring MET hold the hamstring isometric for 7-10 sec and followed by exhalation therapist stretch the muscle 30 second, to straighten the knee towards the new barrier. Repeating this technique until no further gain is possible (usually one or two repetitions achieve the maximum degree of lengthening available at any one session) for 3-4 time. III. Tensor fascia lata (TFL) MET Patient asked to abduct leg against resistance (using less than a 25% strength, slowly take your leg back towards the midline, against my resistance).• After contraction ceases, and patient relaxes, during patient’s exhalation, the leg should be taken to or through the new restriction barrier (into adduction past the barrier) to stretch the muscular fibers of TFL (the upper third structure).• Care taken to ensure that pelvis is not tilted during stretch.• Stability is achieved by therapist pressure maintained against flexed knee/thigh.• Entire process should be repeated several times or until no further gain is possible IV. Conventional osteoarthritis exercises (quadriceps isometric strengthening sets and straight leg raising exercises).V. All of patients will do home exercises program. This program includes conventional exercises such as quadriceps isometric strengthening, straight leg raising, hamstring curls-up and hip abduction exercises. Each exercise is done for 3 sets in each day with 30 repetitions and each repetition will last for 10 seconds muscle contraction period.

Category

Rehabilitation

Recruitment centers

1

Recruitment center

Name of recruitment center

Physical therapy unit/out patients clinic

Full name of responsible person

Baquba teaching hospital

Street address

New baquba

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Sponsors / Funding sources

1

Sponsor

Name of organization / entity

Abbas Fadhil Taher

Full name of responsible person

Abbas Fadhil Taher

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Baquba

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Grant name

Grant code / Reference number

Is the source of funding the same sponsor organization/entity?

Yes

Title of funding source

Abbas Fadhil Taher

Proportion provided by this source

100

Public or private sector
Private
Domestic or foreign origin
Domestic
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
Other

Person responsible for general inquiries

Contact
Name of organization / entity
Tehran University of Medical Sciences
Full name of responsible person
Abbas Taher
Position
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Latest degree
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Person responsible for updating data

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Sharing plan

Deidentified Individual Participant Data Set (IPD)
Undecided - It is not yet known if there will be a plan to make this available
Study Protocol
Undecided - It is not yet known if there will be a plan to make this available
Statistical Analysis Plan
Undecided - It is not yet known if there will be a plan to make this available
Informed Consent Form
Undecided - It is not yet known if there will be a plan to make this available
Clinical Study Report
Undecided - It is not yet known if there will be a plan to make this available
Analytic Code
Undecided - It is not yet known if there will be a plan to make this available
Data Dictionary
Undecided - It is not yet known if there will be a plan to make this available