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The effect of dry needling in gluteus medius on hip strength and stability in active populations

Submission date
20/06/2018

Recruitment status
No longer recruiting

Registration date
24/07/2018

Overall study status
Completed

Last Edited
22/06/2018

Condition category
Musculoskeletal Diseases

[X] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[ ] Record updated in last year

Plain English summary of protocol

Background and study aims
Trigger points are muscular "knots" which can often be felt as tightness or aches in muscles. They are commonly found in both sportspeople and the general population alike. One common treatment technique which has recently gained popularity is that of dry needling. Dry needling uses acupuncture type needles to directly stimulate the trigger point and in doing so, release the tightness (contraction) and pain associated with the trigger point. There are two categories of trigger points: active (trigger points which generate pain spontaneously) and latent (trigger points which only generate pain if stimulated). Because dry needling relaxes the trigger point within muscles, some temporary weaknesses have been reported previously. If these weaknesses were to occur in a muscle which is crucial in stability, athletes may be at an increased risk of injury. The gluteus medius is one such muscle which plays a pivotal role in maintaining hip stability during movements and single leg tasks. It is located on the outermost part of the pelvis and controls the side to side movement of the leg (frontal plane), providing what is known as lumbo-pelvic-hip stability. Decreases in either hip strength or hip stability have been linked to a host of lower limb injuries to the foot, ankle, knee, thigh, hip and even lower back. Trigger points are commonplace in the gluteus medius of multi-directional athletes because of the demands placed on maintaining hip stability during sprinting, cutting, jumping and landing. As such, dry needling is a technique frequently performed on the gluteus medius yet it is still unclear as to the appropriate time before performance which dry needling should be performed, or more importantly, avoided due to possible temporary decreases in hip strength and stability. The aim of this study is to measure hip strength and single leg stability before and after dry needling.

Who can participate?
Male, third level student of the Institute of Technology Carlow, aged 18 to 45, participating in a multi-directional jump-sport (e.g. gaelic football, hurling, soccer, volleyball, basketball, handball) more than 3 times per week, with 2 to 5 latent myofascial trigger points present in their self-reported preferred jumping leg

What does the study involve?
Participants are randomly allocated to be treated with dry needling or dummy dry-needling (placebo) where the needle does not break the skin. Participants only receive the treatment once and it is performed on between 2 and 5 trigger points. There is a quick informal

conversation about how the participant feels about the treatment received, their soreness and their confidence to perform in their given sport. Hip strength and single leg stability are measured before, immediately after and 3, 7, 10 and 14 days after the treatment.

What are the possible benefits and risks of participating?
Participants should they volunteer, may benefit from dry needling as it may reduce tension in their gluteus medius and allow their muscle to perform better in the long term. Some soreness is expected both during the dry needling treatment and in the 24 hours afterwards with slight weaknesses possibly being felt by participants. The participants may also have a slight bruise as a result of the needle piercing the skin.

Where is the study run from?
Institute of Technology Carlow (Ireland)

When is the study starting and how long is it expected to run for?
September 2017 to August 2019

Who is funding the study?
Institute of Technology Carlow (Ireland)

Who is the main contact?
Mr Aaron Byrne
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Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

EudraCT/CTIS number

IRAS number

ClinicalTrials.gov number

Secondary identifying numbers

Study information

Scientific Title
The longitudinal effects of dry needling of latent myofascial trigger points in gluteus medius on hip strength and single-leg time to stabilisation in multi directional and jump-sport athletes

Study objectives
1. Dry needling will cause a short term decrease in hip strength
2. Dry needling will cause a short term increase in time to stabilisation

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethics in Research Committee in the Departments of Science and Health of the Institute of Technology Carlow, Ireland, 26/10/2017, ref: 182

Study design
Randomised placebo-controlled intervention study

Primary study design
Interventional

Secondary study design
Randomised parallel trial

Study setting(s)
Other

Study type(s)
Treatment

Participant information sheet
Not available in web format, please use contact details to request a participant information sheet.

Health condition(s) or problem(s) studied
Latent myofascial trigger points in gluteus medius

Interventions
All participants will be randomly assigned one of the treatments and will not know which treatment they are receiving (single-blinded):
1. Dry needling (intra-muscular stimulation)
2. Placebo dry needling (blunted needle, zero skin penetration)

Participants will only receive the single treatment once and it will be performed on between 2 and 5 trigger points. There will also be a quick informal conversation about how the participant feels about the treatment received, their soreness and their confidence to perform in their given sport.

Hip strength and single leg stability are measured before, immediately after and 3, 7, 10 and 14 days after the treatment. Hip strength will be measured using a portable strain gauge (hand-held dynamometer) which will be fitted to the end of a stabilisation device. Single leg stability will be recorded on a force plate in the form of “time to stabilisation” which records the amount of time needed to stabilise the body to within a certain threshold of bodyweight (5%), a lower time to stabilisation corresponds to better stability as they are able to stabilise faster.

Intervention Type
Other

Primary outcome measure
Measured before, immediately after and 3, 7, 10 and 14 days after the treatment:
1. Hip abduction strength (maximal voluntary isometric contraction), measured using a portable strain gauge (hand-held dynamometer)
2. Hip internal rotation strength (maximal voluntary isometric contraction), measured using a portable strain gauge (hand-held dynamometer)
3. Hip external rotation strength (maximal voluntary isometric contraction), measured using a portable strain gauge (hand-held dynamometer)
4. Single-leg time to stabilisation, recorded on a force plate

Secondary outcome measures
The secondary outcome measures will be qualitative by nature and obtained through semi-structured interviews upon the completion of each of the follow-up measurements of stability (immediately post treatment, 3, 7, 10 and 14 days post treatment). All interviews will be conducted in private by a single interviewer and will be audio recorded for thematic analysis at a later date in order to give greater depth as to the effects dry needling may have on sporting performance.
1. Perceived stability
2. Perceived ability to perform in their given sport
3. Confidence in ability to perform
4. Local soreness (VAS)

Overall study start date
01/09/2017

Completion date
01/08/2019

Eligibility

Key inclusion criteria
Participants meet inclusion criteria if they:
1. Are a male, third level student of the Institute of Technology Carlow
2. Are aged between 18 and 45 years
3. At the time of testing, are participating in a multi-directional jump-sport including but not limited to; gaelic football, hurling, soccer, volleyball, basketball, handball more than 3 times per

week
3. Have, as identified in a formal screening session; between 2 and 5 latent myofascial trigger points present in their self-reported preferred jumping leg

Participant type(s)
Healthy volunteer

Age group
Adult

Lower age limit
18 Years

Sex
Male

Target number of participants
n=50 participants divided evenly between both intervention (dry needling) and placebo (zero skin penetration) groups

Key exclusion criteria
Participants will be excluded if they:
1. Have, at the time of testing, any injury to the lower limb or low back. Injury is defined as "any injury that prevents a player from taking a full part in all training and match play activities" (Brooks et al. 2005)
2. Present with signs of or report during screening process, any neurological or bleeding disorders
3. Have a needle phobia or aicmophobia

Date of first enrolment
01/09/2018

Date of final enrolment
22/12/2018

Locations

Countries of recruitment
Ireland

Study participating centre
Institute of Technology Carlow
Kilkenny Road
Carlow
Ireland
0000

Sponsor information

Organisation
Institute of Technology Carlow

Sponsor details
Kilkenny Road
Carlow
Ireland
0000

Sponsor type
University/education

Funder(s)

Funder type
University/education

Funder Name
Institute of Technology Carlow

Results and Publications

Publication and dissemination plan
This study is being conducted as completion of a Research MSc in Rehabilitative Sciences, as such, the total study, protocols used, data analysis undertaken will all be represented in the submission. It is planned to publish in a high impact factor journal approximately one year from the completion and submission of the dissertation and the completion of the trial.

Intention to publish date
01/08/2020

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Mr Aaron Byrne (aaron.byrne@itcarlow.ie). Upon the completion of the trial, all anonymised raw datasets will be made available upon request and will also be present in appendices of the final dissertation submission.

IPD sharing plan summary
Available on request