

Clinical Trial Protocol

Iranian Registry of Clinical Trials

10 Jun 2026

Effects of a single strength weight and plyometric training session on some of DOMS indices in male Taekwondo athletes

Protocol summary

Summary

Introduction: Based on conflicting results and concerns related to plyometric exercise- induced muscle soreness, the present study will be conducted to compare the effect of a single-session plyometric and strength weight training on some biochemical, inflammatory and performance indices of delay onset muscle soreness (DOMS) in male Taekwondo athletes. Methods: In a quasi-experimental design, twenty Taekwondo athletes (aged 25-28 years, BMI 18-22 Kg/m² and at least 3 years sport history) in two random homogeneous groups will participate in an exhaustive single-session strength weight training (6 sets leg press and Knee extension with 70% one repetition maximum) or plyometric training (6 sets deep and side jump with 70% Maximum high jump). Biochemical (Serum creatine kinase: CK), inflammatory (Peripheral blood leukocyte count; Serum C-reactive protein: CRP; interleukin-6: IL-6; Thigh circumference and perceived soreness) and performance indicators (Flexibility, maximal isometric strength and explosive power lower limb) will be determined in both groups during the four stages (10 days, 30 min before and immediately and 24 hours after the exercise session). Serum CK, CRP and IL-6 will be measured by photometric, immunoturbidometric and ELISA assays (with commercial Pars-Azmoon and Bendermed kits), respectively. The peripheral blood leukocyte counts will be determined by automatic analyzer. Muscle circumference and perceived soreness will be determined by flexible tap and Talag Scale, respectively. Flexibility, maximal isometric strength and explosive power of lower limb will be determined by wells, dynamometric and sargent vertical jump tests, respectively. Data will be expressed as mean (\pm SD) and analyzed by repeated measure ANOVA, Bonferroni and independent samples t tests at $P \leq 0.05$.

General information

Acronym

PlyoDOMS2011

IRCT registration information

IRCT registration number: **IRCT201011304663N5**
Registration date: **2012-08-01, 1391/05/11**
Registration timing: **retrospective**

Last update:

Update count: **0**

Registration date

2012-08-01, 1391/05/11

Registrant information

Name

Afshar Jafari

Name of organization / entity

University of Tabriz

Country

Iran (Islamic Republic of)

Phone

+98 41 1339 3251

Email address

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Recruitment status

Recruitment complete

Funding source

University of Tabriz

Expected recruitment start date

2010-08-25, 1389/06/03

Expected recruitment end date

2010-09-28, 1389/07/06

Actual recruitment start date

empty

Actual recruitment end date

empty

Trial completion date

empty

Scientific title

Effects of a single strength weight and plyometric

training session on some of DOMS indices in male Taekwondo athletes

Public title

Plyometric and resistance training effects on DOMS indices

Purpose

Basic science

Inclusion/Exclusion criteria

Inclusion criteria: Healthy males; taekwondo athletes; aged 25-28 years; BMI 18-22 Kg/m²; fat percent less than 15%; High jump more than 45 cm; and at least 3 years sport history; without any anti-inflammatory and medical drugs intake (during 6 months prior to the study). Exclusion criteria: chronic diseases; injuries; and uncontrolled intake of stimulants (such as caffeine > 100 mg/day); uncontrolled intake of oxidative supplements; uncontrolled intake of anti-inflammatory drugs (during the period).

Age

From **25 years** old to **28 years** old

Gender

Male

Phase

N/A

Groups that have been masked

No information

Sample size

Target sample size: **20**

Randomization (investigator's opinion)

Randomized

Randomization description

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

Tabriz University of Medical Sciences

Street address

Golgasht St. Daneshgah St. Tabriz

City

Tabriz

Postal code

Approval date

2010-08-23, 1389/06/01

Ethics committee reference number

8931

Health conditions studied

1

Description of health condition studied

Exercise-induced muscle damage

ICD-10 code

M79.1

ICD-10 code description

Myalgia

Primary outcomes

1

Description

Peripheral blood leukocyte count

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

It will determine by automatic analyzer.

2

Description

Total Serum Creatine kinase (CK)

Timepoint

Baseline, 30 min pre and immediately and 24 h post plyometric and strength exercise

Method of measurement

Photometric methods with commercial kits (Pars-Azmoon)

3

Description

IL-6

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

ELISA methods with commercial kits

4

Description

C-reactive protein

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

immunoturbidometric assay

5

Description

Perceived soreness

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

Talag Scale

6

Description

Muscle circumference

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

It will determine by flexible tap

7

Description

Lower limb flexibility

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

Sit and reach test (wells)

8

Description

Lower limb maximal isometric strength

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

Dynamometric measurement

9

Description

Lower limb

Timepoint

10 days, 30 min before and immediately and 24 hours after the exercise session

Method of measurement

Sargent vertical jump test

Secondary outcomes

1

Description

Peripheral blood lactate

Timepoint

Blood lactate will determine at 30 min before and immediately after the exercise session.

Method of measurement

It will determine by portable lactate analyzer

2

Description

Maximal Oxygen Consumption

Timepoint

It will determined at 10 days before the exercise session.

Method of measurement

It will determine by Bruce test.

3

Description

Rating perceived exertion

Timepoint

It will determined at immediately before and after each bout of the exercises.

Method of measurement

It will determine by Borg Scale .

Intervention groups

1

Description

Strength training group will perform six sets of exhaustive leg extensions and leg press (with 70% 1RM).

Category

Other

2

Description

Plyometric group will perform six sets of exhaustive drop and side jumps (with 70% Maximum High Jump).

Category

Other

Recruitment centers

1

Recruitment center

Name of recruitment center

The Taekwondo Board of East Azerbaijan

Full name of responsible person

Dr Afshar Jafari

Street address

Iran, Islamic Republic Of

City

Tabriz

Sponsors / Funding sources

1

Sponsor

Name of organization / entity

University of Tabriz

Full name of responsible person

Dr Afshar Jafari

Street address

Faculty of physical education & sports sciences, University of Tabriz, Tabriz, Iran

City

Tabriz

Grant name

Grant code / Reference number

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

Yes

Title of funding source

University of Tabriz
Proportion provided by this source
100
Public or private sector
empty
Domestic or foreign origin
empty
Category of foreign source of funding
empty
Country of origin
Type of organization providing the funding
empty

Person responsible for general inquiries

Contact

Person responsible for scientific inquiries

Contact

Name of organization / entity

University of Tabriz

Full name of responsible person

Dr Afshar Jafari

Position

PhD in Molecular Exercise Physiology

Other areas of specialty/work

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Web page address

Person responsible for updating data

Contact

Sharing plan

Deidentified Individual Participant Data Set (IPD)

empty

Study Protocol

empty

Statistical Analysis Plan

empty

Informed Consent Form

empty

Clinical Study Report

empty

Analytic Code

empty

Data Dictionary

empty