ISRCTN10914527 https://doi.org/10.1186/ISRCTN10914527

# Testing how light resistance exercises with blood flow restriction can help treat tennis elbow: a controlled study

**Submission date**
08/01/2025

**Recruitment status**
No longer recruiting

**Registration date**
14/01/2025

**Overall study status**
Completed

**Last Edited**
10/01/2025

**Condition category**
Musculoskeletal Diseases

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

## Plain English summary of protocol

Background and study aims
Blood flow restriction (BFR) training is a specialized exercise method that has gained attention for its ability to enhance the effects of resistance training, even when performed with low weights or resistance. This makes it particularly useful for individuals who are unable to engage in high-intensity resistance training, such as those with certain clinical conditions or musculoskeletal injuries. Traditional high-intensity strength training can be challenging and sometimes risky for these populations, leading to potential complications or prolonged recovery periods. Lateral epicondylitis, commonly known as tennis elbow, is a condition characterized by pain and tenderness on the outer part of the elbow, typically resulting from overuse of the forearm muscles. It is a common musculoskeletal injury that can significantly affect daily activities and overall quality of life. Patients with lateral epicondylitis often require rehabilitation programs to manage pain and restore function. This study aims to explore the potential benefits of incorporating BFR into a low-intensity therapeutic exercise program specifically designed for patients with lateral epicondylitis. Over 4 weeks, the study seeks to determine whether BFR could improve recovery outcomes, reduce pain, and enhance muscle strength more effectively than standard low-intensity.

Who can participate?
Patients who have been diagnosed with lateral epicondylitis for more than one month

What does the study involve?
Participants will be asked to engage in a therapeutic exercise program that incorporates BFR. The program will be conducted over 4 weeks, with participants attending sessions three times per week. Each session involved low-intensity resistance exercises targeting the muscles of the forearm and upper arm, which are typically affected in lateral epicondylitis. Participants perform the prescribed exercises under the supervision of trained therapists

What are the possible benefits and risks of participating?
Participating in this study offered several potential benefits. First and foremost, the inclusion of BFR in the rehabilitation program is expected to enhance the training effects compared to

standard low-intensity exercises. This means that participants might experience better muscle strength and quicker recovery with less overall effort. However, it is important to note that while BFR has shown promise in enhancing training effects, it might not necessarily lead to better outcomes for every participant.

Where is the study run from?
The study was conducted at a hospital located in southern Taiwan, which provided a clinical setting equipped with the necessary facilities and staff to conduct the rehabilitation program.

When is the study starting and how long is it expected to run for?
March 2022 to December 2022

Who is funding the study?
Ministry of Science and Technology, Taiwan

Who is the main contact?
1. Chong-Qing Wu, altl0411@hotmail.com
2. Lan-Yuen Guo, yuen@kmu.edu.tw

# Contact information

### Type(s)
Public, Scientific, Principal investigator

### Contact name
Prof Lan-Yuen Guo

### Contact details
Department of Sports Medicine, Kaohsiung Medical University
No.100, Shiquan 1st Road, Sanmin District
Kaohsiung City
Taiwan
807378
+886 7-3121101#2737#624
yuen@kmu.edu.tw

### Type(s)
Public, Scientific, Principal investigator

### Contact name
Mr Chong-Qing Wu

### Contact details
No. 270, Ziyou Road
Pingtung City
Taiwan
900
+886 08-7363011
altl0411@hotmail.com

# Additional identifiers

### Protocol serial number
B11102

# Study information

### Scientific Title
Investigating the clinical efficacy of low-intensity resistance training combined with blood flow restriction in the management of lateral epicondylitis: a randomized parallel study

### Study objectives
For patients with musculoskeletal injuries, low-intensity training could provide specific benefits of exercise effect than the traditional physical therapy

### Ethics approval required
Ethics approval required

### Ethics approval(s)
Approved 22/04/2022, Pingtung Christian Hospital Institutional Review Board (No. 60, Ta-Lian Road, Pingtung, 900, Taiwan; +886 8 7368686; 03549@ptch.org.tw), ref: IRB707B

### Primary study design
Interventional

### Study design
Randomized controlled parallel design study

### Study type(s)
Treatment

### Health condition(s) or problem(s) studied
Therapeutic exercise for lateral epicondylitis

### Interventions
This is a randomized controlled parallel design study that evaluates participants diagnosed with lateral epicondylitis. Participants will be randomly assigned to either the experimental group with low-intensity resistance with blood flow restriction training (LR-BFR) or the control group with low-intensity resistance training only using a lottery system. Both groups will receive 4 weeks of intervention. Participants attend three sessions per week, making a total of 12 sessions throughout the study. Each session lasted approximately 30 to 45 minutes.

### Intervention Type
Behavioural

### Primary outcome(s)
The following primary outcome measures are assessed before and after the training period:
1. Pain measured using a Visual Analogue Scale (VAS)
2. Tenderness threshold measured using an algometer
3. Pain-free grip strength (PFGS) measured using a dynamometer

### Key secondary outcome(s)
Pain and disability associated with lateral epicondylitis measured using the Patient-Rated Tennis Elbow Assessment (PRTEE) before and after the training period

### Completion date
31/12/2022

## Eligibility

### Key inclusion criteria
1. Participants between the ages of 30 and 60 years who were diagnosed with lateral epicondylitis by a physician
2. Unilateral elbow pain persisting for more than 1 month
3. No significant improvement in pain around the lateral epicondyle of the humerus within 4 weeks despite medication/physical therapy

### Participant type(s)
Patient

### Healthy volunteers allowed
No

### Age group
Adult

### Lower age limit
30 Years

### Upper age limit
60 Years

### Sex
All

### Total final enrolment
12

### Key exclusion criteria
1. History of elbow trauma, ligament injury, fracture, tumor, or surgery
2. Diagnosed or treated for cervical radiculopathy or systemic arthritis
3. Presence of cardiovascular disease (eg, heart disease, varicose veins, peripheral arterial disease, Raynaud's syndrome, etc.)
4. Administration of corticosteroid injections, proliferation therapy, or similar medications within the past 3 months
5. Bilateral elbow pain
6. Previous experience with blood flow restriction training

### Date of first enrolment
22/04/2022

**Date of final enrolment**
31/08/2022

# Locations

**Countries of recruitment**
Taiwan

**Study participating centre**
**Ministry of Health and Welfare Pingtung Hospital**
No. 270, Ziyou Road, Pingtung City, Taiwan
Pingtung County
Taiwan
90054

# Sponsor information

**Organisation**
Pingtung Hospital

**ROR**
https://ror.org/039f5ga37

# Funder(s)

**Funder type**
Government

**Funder Name**
Ministry of Science and Technology, Taiwan

**Alternative Name(s)**
Ministry of Science and Technology, R.O.C. (Taiwan), Ministry of Science and Technology of Taiwan, MOST

**Funding Body Type**
Government organisation

**Funding Body Subtype**
National government

### Location
Taiwan

## Results and Publications

### Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Chong-Qing Wu, altl0411@hotmail.com and Lan-Yuen Guo, yuen@kmu.edu.tw

• The type of data that will be shared: Statistical analysis results derived from participant-level data will be shared
• Timing for availability: after research publication
• Whether consent from participants was required and obtained: Consent for data sharing was obtained from participants as part of the informed consent process during recruitment.
• Comments on data anonymization: All shared data will be fully anonymized to protect participant confidentiality
• Any ethical or legal restrictions: Data sharing is subject to approval from the ethics committee and will comply with institutional policies and applicable legal regulations. Access to data will be granted only for non-commercial research purposes and under a data-sharing agreement
• Any additional comments: The data will be shared upon reasonable request, provided that the requestor submits a clear research proposal outlining the intended use of the data and agrees to comply with ethical and legal guidelines for data use. Additional supporting documents, such as the study protocol, will also be available upon request

### IPD sharing plan summary
Available on request