

# Can breathing pure oxygen at high pressure improve exercise-induced muscle injury recovery in baseball players?

<b>Submission date</b> 14/03/2019	<b>Recruitment status</b> No longer recruiting	<input type="checkbox"/> Prospectively registered
<b>Registration date</b> 22/03/2019	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 11/02/2020	<b>Condition category</b> Musculoskeletal Diseases	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Hyperbaric oxygen therapy (HBOT) involves a person breathing pure oxygen at higher pressure than normal air pressure. Air normally contains about 21% oxygen and 78% nitrogen, so HBOT provides more oxygen to the body than is normally breathed in. It is thought that HBOT might result in muscle injuries healing more quickly, which would be an advantage to those playing sport competitively or professionally. This study aims to investigate whether HBOT improved recovery of muscle soreness and strains caused by exercise in baseball players.

### Who can participate?

Professional or amateur male baseball players in training or the baseball season who have a muscle injury caused by exercise.

### What does the study involve?

The participants will be randomly allocated to one of two groups. Both groups will spend 10 sessions of 100 minutes over 5 weeks in a pressurised chamber, where the pressure will be raised to above normal. One group will breathe pure oxygen while in the chamber and the other will breathe normal air. Oxygen and nitrogen are colourless gases with no smell so the participants will not be able to tell which gas they are breathing. Before the first session, after the fifth session, after the last session and 2 weeks after the last session, the participants will be asked to give a blood sample and to rate their muscle pain and how much it affects their daily activities.

### What are the possible benefits and risks of participating?

Those who breathe pure oxygen might experience earlier recovery of the muscle injury. There is also a small risk of side effects caused by absorbing too much oxygen.

### Where is the study run from?

Kaohsiung Chang Gung Memorial Hospital, Taiwan, Republic of China

When is the study starting and how long is it expected to run for?  
August 2013 to August 2016

Who is funding the study?  
Chang Gung Research Fund (Taiwan)

Who is the main contact?  
Miss Chen-Yu Chen

## Contact information

**Type(s)**  
Public

**Contact name**  
Dr Wen-Yi Chou

**ORCID ID**  
<https://orcid.org/0000-0002-8400-3457>

**Contact details**  
123 Ta Pei Road, Niao Sung  
Kaohsiung  
Taiwan  
83301  
+886-7-7317123  
[murraychou@yahoo.com.tw](mailto:murraychou@yahoo.com.tw)

## Additional identifiers

**Clinical Trials Information System (CTIS)**  
Nil known

**ClinicalTrials.gov (NCT)**  
Nil known

**Protocol serial number**  
Chang Gung Research Fund grant CMRPG8D0411

## Study information

**Scientific Title**  
Hyperbaric oxygen therapy influence of high-intensity athletes in vivo metabolic indicators

**Study objectives**  
HBOT could facilitate the early recovery of exercise-related muscular injury and could therefore be beneficial for elite athletes.

**Ethics approval required**

Old ethics approval format

### **Ethics approval(s)**

Approved 21/08/2013, Institutional Review Board (IRB) of Chang Gung Medical Foundation (123 Dinghu Rd, Guishan Township, Taoyuan County, Taiwan (R.O.C.); +886 3 3196200 ext 3707/3703; merlinchi@cgmh.org.tw), ref: 102-2994B

### **Study design**

Prospective randomized double-blind controlled study

### **Primary study design**

Interventional

### **Study type(s)**

Treatment

### **Health condition(s) or problem(s) studied**

Exercise-related muscular injury

### **Interventions**

41 participants were recruited between June 2014 and December 2015 and were divided into study group and control group with 20 and 21 participants. All the participants received either HBOT or placebo sessions twice in a week. The study group and the control group stayed in a hyperbaric chamber pressurized to 2.5 and 1.3 atm, and breathed pure oxygen and general air, respectively. The duration of each session was 100 mins, and 10 sessions were completed in 5 weeks for each participant.

### **Intervention Type**

Supplement

### **Primary outcome(s)**

1. Serum creatine phosphokinase (CPK)
2. Serum glutamic-oxaloacetic transaminase (GOT)
3. Serum myoglobin
4. Blood urine nitrogen (BUN)
5. Serum lactate

Data were collected before the treatment (T1), end of 5th HBOT (T2), end of 10th HBOT (T3), and 2 weeks after the 10th HBOT (T4).

### **Key secondary outcome(s)**

1. Pain intensity assessed using the Brief Pain Inventory before the treatment (T1), end of 5th HBOT (T2), end of 10th HBOT (T3), and 2 weeks after the 10th HBOT (T4)
2. Pain interference assessed using the Brief Pain Inventory before the treatment (T1), end of 5th HBOT (T2), end of 10th HBOT (T3), and 2 weeks after the 10th HBOT (T4)

### **Completion date**

19/08/2016

## **Eligibility**

**Key inclusion criteria**

1. Aged 20 years or older
2. Diagnosed with prolonged (more than 2 weeks) exercise-induced muscular soreness or pain with grade I muscle strain of the extremities
3. Currently under intensive and regular baseball training or regular baseball season

**Participant type(s)**

Patient

**Healthy volunteers allowed**

No

**Age group**

Adult

**Sex**

All

**Total final enrolment**

41

**Key exclusion criteria**

1. Pneumothorax
2. Upper respiratory tract infection
3. Recently received chest or ear surgery
4. Claustrophobic

**Date of first enrolment**

07/07/2014

**Date of final enrolment**

11/09/2015

**Locations****Countries of recruitment**

Taiwan

**Study participating centre**

**Kaohsiung Chang Gung Memorial Hospital**

123, Ta Pei Road, Niao Sung District

Kaohsiung

Taiwan

83301

**Sponsor information**

**Organisation**

Chang Gung Memorial Hospital

**ROR**

<https://ror.org/02verss31>

**Funder(s)****Funder type**

Hospital/treatment centre

**Funder Name**

Chang Gung Medical Foundation

**Alternative Name(s)****Funding Body Type**

Private sector organisation

**Funding Body Subtype**

Trusts, charities, foundations (both public and private)

**Location**

Taiwan

**Results and Publications****Individual participant data (IPD) sharing plan**

The datasets generated and/or analyzed during the current study during this study will be included in the subsequent results publication.

**IPD sharing plan summary**

Other

**Study outputs**

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	results	29/05/2019	11/02/2020	Yes	No