Does physiotherapy help manage the DOMS response in EIMD?

By

Martin Meyer
Masters Sports Physiotherapy
What is DOMS and EIMD?

- Exercised Induced Muscle Damage
  - Eccentric muscle activity
  - Pain, loss of motion, loss of strength, swelling

- Delayed Onset Muscle Soreness
  - Begins 48-72 hours post
  - Lasts 7 to 10 days
Theories?

- Lactic acid theory - accumulation of lactic acid
- Spasm theory - pain and spasm cycle
- Connective tissue damage theory
- Muscle damage theory
Latest Theory

- **Mechanical factors**
  - Fewer motor units firing
  - Z band streaming
  - Rises shown in Creatine Kinase levels

- **Calcium Homeostasis**
  - Elevation in intracellular Ca levels
    (Clarkson and Sayers 1999, Armstrong 1991)
Inflammation

- Neutrophil, macrophage and leukocyte infiltration (Smith 1991)
- WBC counts
- Use of anti-inflammatories??
Effects?

- **Pain**
  - Swelling and oedema (Smith 1991)
  - Inflammatory mediators (Clarkson and Newham 1995)

- **Increase in muscle stiffness**
  - Swelling and oedema (Clarkson and Sayers 1999)
  - Ca accumulation (Clarkson and Newham 1995)

- **Loss of muscle strength**
  - Sarcomere over-stretching (Clarkson and Newham 1995)
  - Fatigue (Westerbald et al 1993)
Does physio help?

- Ultrasound
- Electrical stimulation
- Massage and accupressure
- Repeat bout exercise
- Cryotherapy
- Preventative training
Ultrasound

Varied results

- Hasson et al (1990)- effective
- Plaskett et al (1999)- ineffective
- Craig et al (1999)- ineffective
Electrical Stimulation

Varied Results

- *Denegar et al (1989)*- effective
- *Schmitz et al (1997)*- effective
- *Allen et al (1999)*- ineffective
Massage and Accupressure

May have positive effect

- **Ernst (1998)** - good review article
  - 5 out of 7 studies reviewed - effective

- **Smith et al (1994)** - effective, but timing crucial

- **Charles-Liscombe (1998)** - effective
Repeat Bout Exercise

Varied results

- *Hasson et al* (1989) - concentric effective
- *Smith* (1994) - eccentric ineffective
Cryotherapy

No effect

- Braun and Clarkson (1989) - ineffective
- Paddon-Jones and Quigley (1997) - ineffective
Preventative Training

Best treatment to date

- Cleak and Eston (1992)- effective
- Friden et al (1983)- effective
- Clarkson and Tremblay (1988)- effective
Summary

- No conclusive evidence as to what causes DOMS
- Physiotherapy modalities effective?
- Physiotherapy modalities ineffective?
Future research

- Must include:
  - Large sample sizes
  - One modality assessed at one time
  - Ensure no confounders
  - Control groups and placebo


