

Effect of a new treatment technique on Delayed Onset Muscle Soreness recovery

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BACKGROUND & PURPOSE

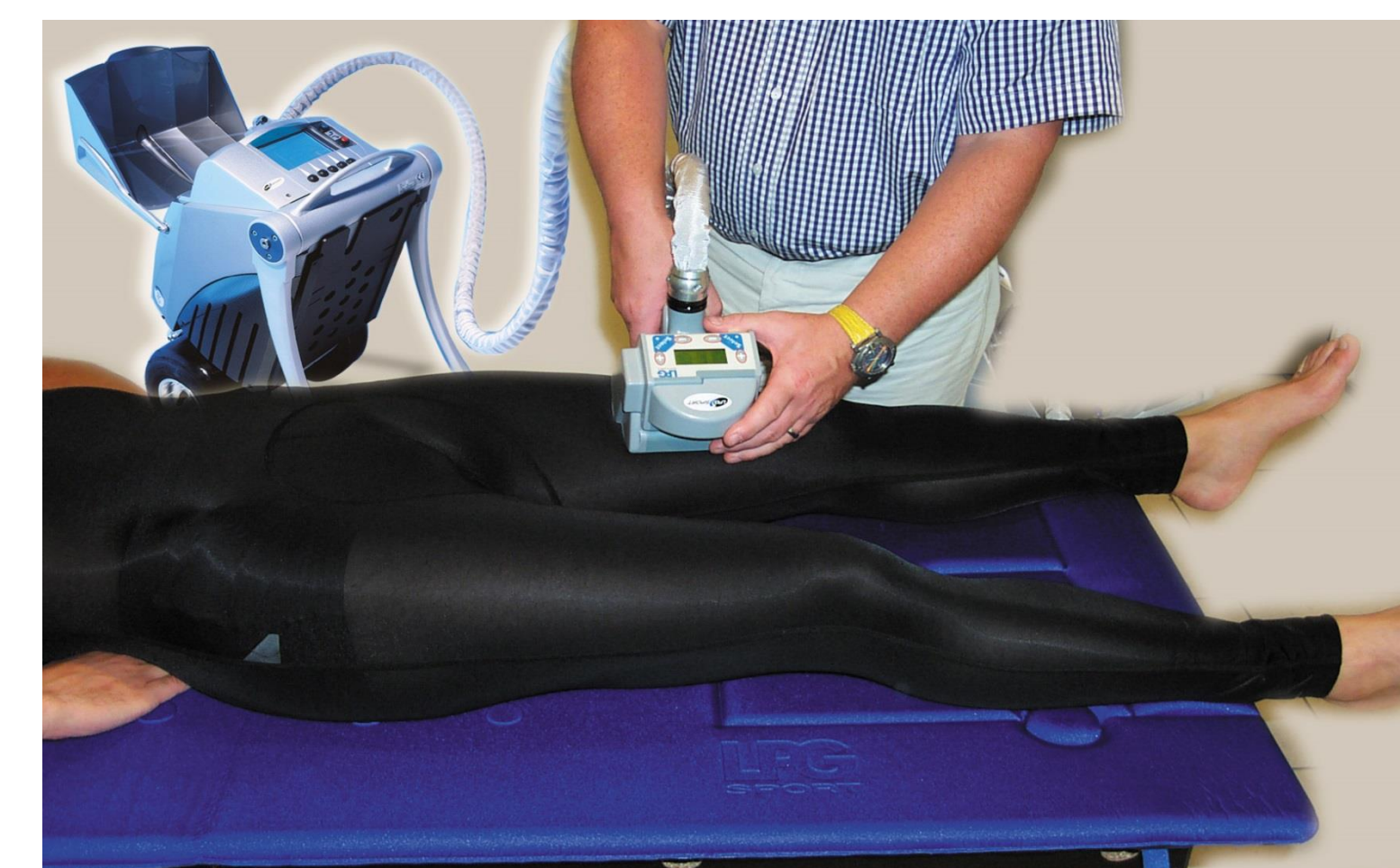
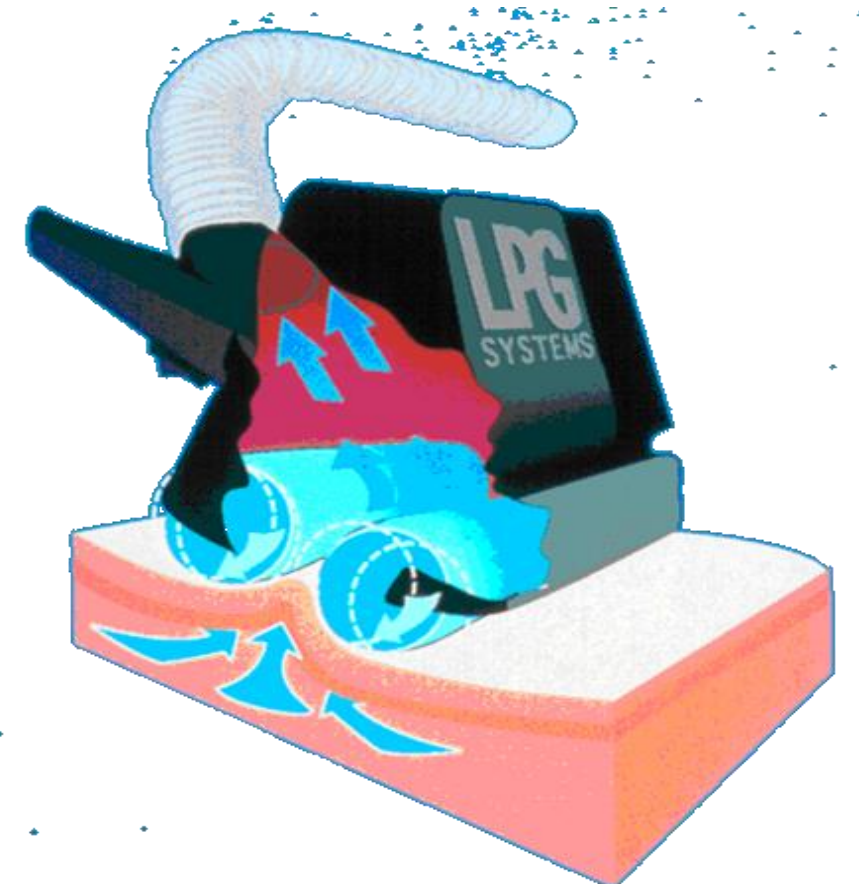
Delayed onset muscle soreness (DOMS) is a common occurrence following unaccustomed physical activity which can have a drastic effect on performance (Nosaka & Clarkson 1996; Fridén & Lieber 2001). However, no universally accepted **treatment** exists (Tiidus 1999).

☞ The aim was to determine the effects of a new technique (LPG Systems) on DOMS induced by eccentric exercise (EE)

METHODS

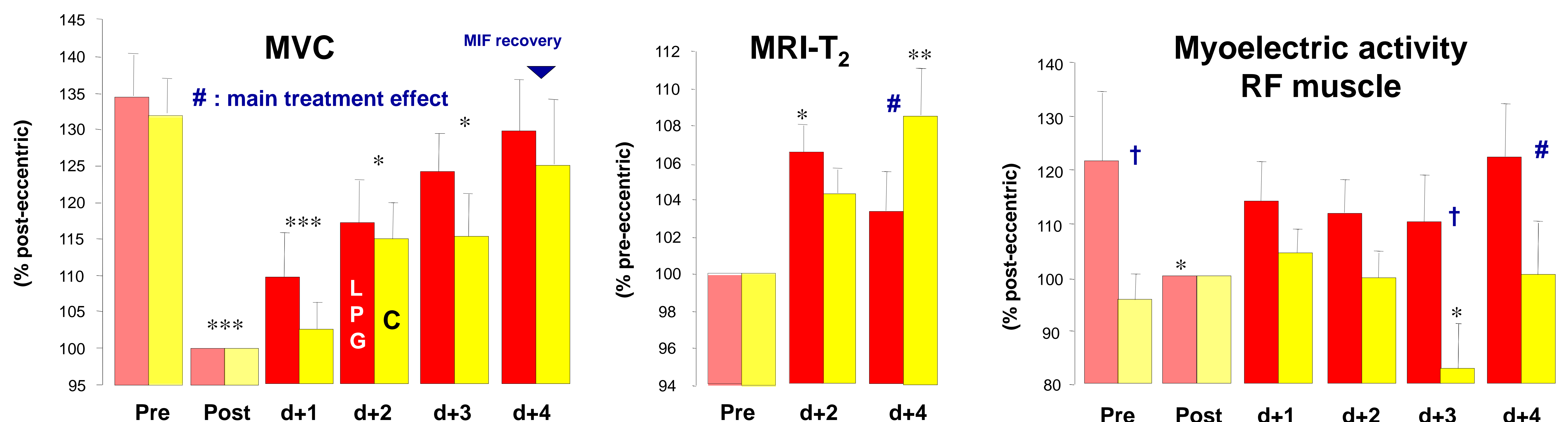
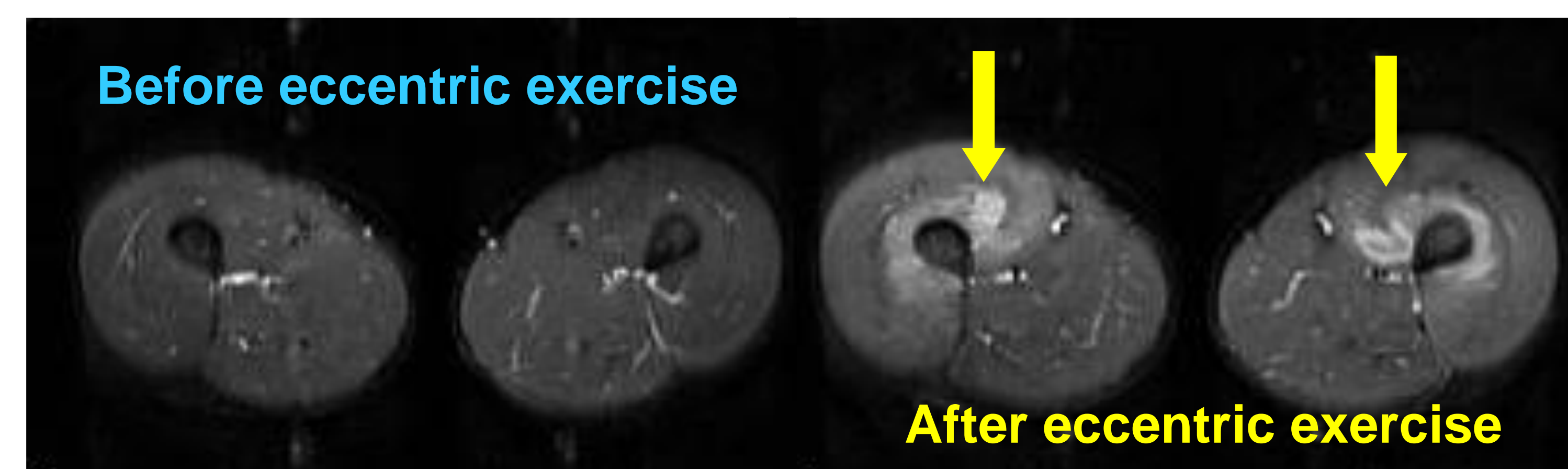
- 10 healthy men, moderately active experienced DOMS induced by **maximal isokinetic EE of knee extensor muscles**
⇒ 8 sets x 15 rep. at -120°.s⁻¹ - 90° ROM (90° to full extension) - 3 min rest - DC = 1/8 (1 rep/6 sec.)
- **Bilateral measures from day₀ pre-exercise to day₄ post-exercise**
⇒ Surface EMG (RMS) on Maximal Isometric Force (MIF)
⇒ Magnetic Resonance Imaging (T₂ relaxation time) and thigh girth
⇒ Perceived **soreness** and muscle **Tenderness**
- Random treated side (**LPG** ■) and untreated as control (**C** ■) with the same workload (85% W_{max})
- Treatment : **15 minutes** /day from d₀ post-exercise to d₄
- ANOVA with repeated measurements (Side x Day)

LPG technique (LPG S6 device) lifts cutaneous and subcutaneous tissues by use of suction and mobilizes them between rollers



RESULTS

- **Effects of maximal EE on muscle function**
 - Decrease in MIF and Neuromuscular efficiency (NME) ☞ **Peripheral fatigue (Ca²⁺)**
 - Increase in soreness indices (Perceived soreness and tenderness), in muscle swelling (T₂ and thigh girth)
- **Effects of LPG treatment on recovery of symptoms of muscle damage**
 - + Faster recovery of MIF and NME
 - + Maintenance of myoelectric activity of the bi-articular RF
 - + Prevention of muscle swelling (thigh girth and MRI-T₂)
 - No complete recovery of soreness indices at d₄
- **Positive relationship between MIF vs NME during recovery**
 - ⇒ LPG (r² = 0.81, P < 0.001) ■
 - ⇒ C (r² = 0.19, NS) ■



P<0.05, †P<0.01 significant treatment effect * P<0.05, ** P<0.01, *** P<0.001: significant difference from pre-eccentric

CONCLUSION

- EE induces a decline in NME suggesting a perturbation in **Excitation-contraction coupling** (Morgan & Allen 1999)
- LPG mechanical treatment **alleviates DOMS symptoms**:
 - ⇒ Adaptation of neural drive (RF mainly): **early recovery (day 1 to 3)** ☞ **NME recovery**
 - ⇒ Reduction of muscle swelling: **day 3 to 4**
- Soreness indices were not indicators of MIF recovery

References

Fridén & Lieber (2001). Acta Physiol Scand 171: 321-326
Tiidus (1999). Can J Appl Physiol 24: 267-278

Morgan & Allen (1999). J Appl Physiol 87: 2007-2015
Nosaka & Clarkson (1996). Med Sci Sports Exerc 28: 953-961