



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

Maïsetti O[§], Mairet S[§], Chemoul G[§], Feldman L[¶], Leroy-Willig A[§], Hogrel JY[§], Portero P[§]

[¶]University Paris XII, [§]Institut of Myology, Paris, [¶]CIERM Kremlin-Bicêtre, France

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 focus of this study was on the real 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^o/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
- ⇒ Clinical parameters (perceived soreness and 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

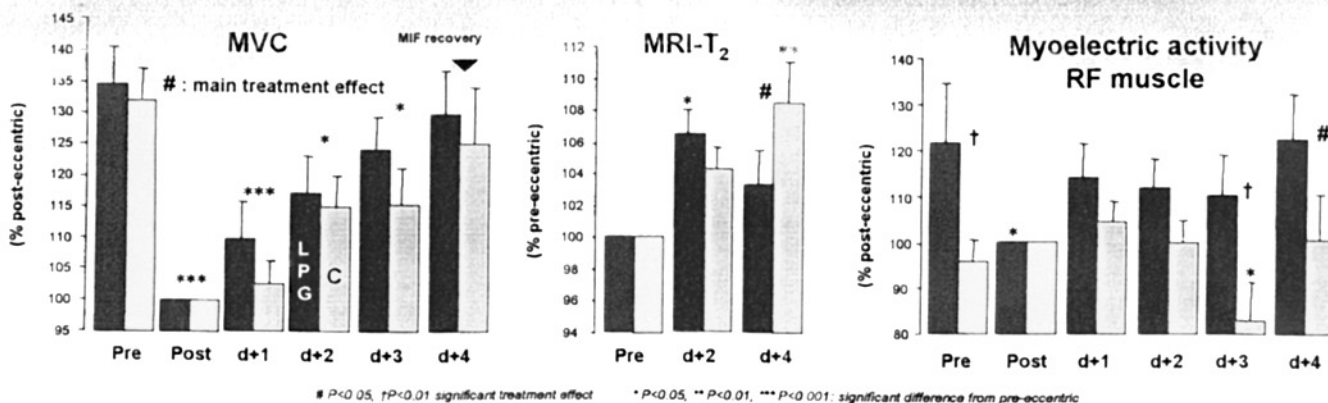
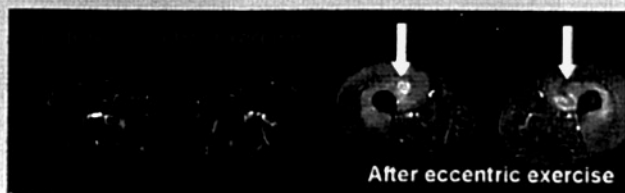
- Decrease in MIF and Neuromuscular efficiency (NME) ⇨ Peripheral fatigue (Ca²⁺)
- Increase in soreness indices (Perceived soreness and tenderness), muscle swelling (T₂ and thigh girth)

• Effects of LPG treatment on recovery of symptoms of muscle damage

- + Faster recovery of MIF and NME
- + Maintenance of myoelectric activity (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) □



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)
 - ⇒ Reduction of muscle swelling: day 3 to 4
- Soreness indices were not indicator of MIF recovery

□ NME 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

