

The forgotten role of back muscle characteristics to tailor exercise therapy for recurrent non-specific low back pain: Study protocol for the Back-to-Back study

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BACKGROUND

- Non-specific low back pain (NSLBP) is a common and costly problem. Exercise therapy is advised as one of the primary treatment approaches, but the effects are only low to moderate.
- Targeting exercise therapy to the underlying mechanisms of NSLBP could increase its efficacy.
- Previous studies in patients with NSLBP observed structural and functional changes in the lumbar multifidus (LM) and erector spinae (ES) muscles.

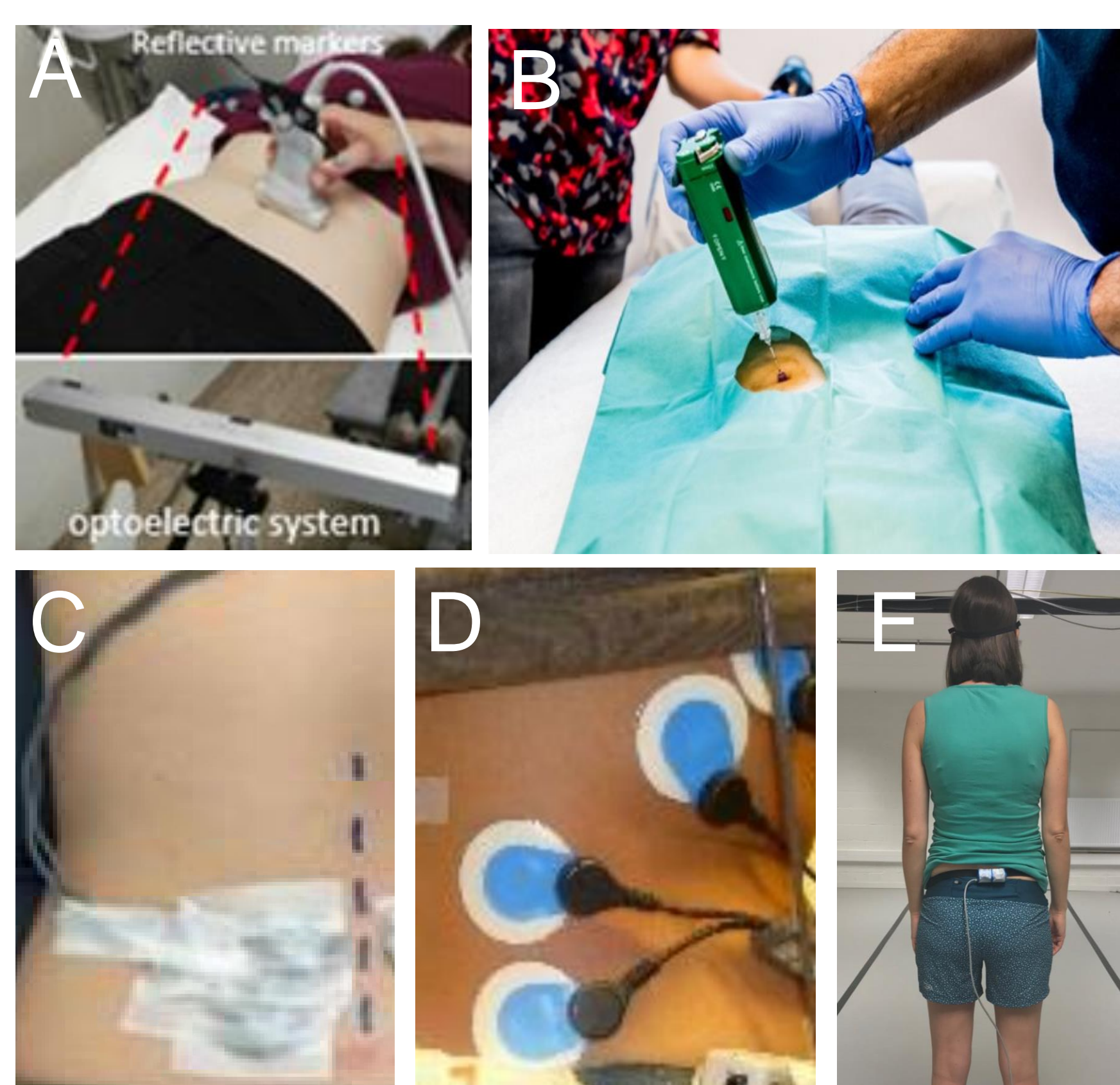
OBJECTIVE

To determine phenotypes of patients with NSLBP based on structural and functional characteristics of the back muscles and to evaluate the effect of exercise therapy on these characteristics and on disability.

METHODS

Part I: Cross-sectional study

- 53 patients with NSLBP, 47 controls
- Characteristics of LM and ES:
 - A. Volume: 3D freehand ultrasound
 - B. Muscle fiber type: micro-biopsy
 - C. Oxygenation: near-infrared spectroscopy
 - D. Activation: electromyography
 - E. Proprioceptive use: muscle vibration, force plate
- Determine most discriminating muscle characteristics, delineate phenotypes.



Part II: Proof-of-concept study

- 53 patients with NSLBP
- Intervention: 16-week training program with 10 supervised sessions
 - Functional low-load proprioceptive exercises integrated into daily life and performed at home
 - One high-load lifting exercise
- Back muscle characteristics and disability assessed at five time points



STUDY PROGRESS

The study is approved by the Ethical Committees of UZ/KU Leuven and UHasselt (S67192). Participant recruitment and data collection will start in Sep 2023.

POTENTIAL IMPACT

This study will help optimize the patient-tailored treatment of NSLBP by identifying muscle-based phenotypes and assessing the effect of exercise therapy on back muscle characteristics in NSLBP within each phenotype.

FUNDING & CONTRIBUTORS



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