

# The influence of 'deep breathing' on pain in patients with fibromyalgia and Ehler-Danlos hypermobility type, compared to healthy controls



Linda Hermans<sup>1,2</sup>, PT; Inge De Wandele<sup>2</sup>, PT; Jessica Van Oosterwijck<sup>1,3</sup>, PhD; Griet Brusselmans, MD<sup>4</sup>; Filip Descheemaeker<sup>2,4</sup>, PT; Patrick Calders<sup>2</sup>, PhD; Mira Meeus<sup>1,2,5</sup>, PhD



1. "Pain in motion" research group, Rehabilitation Sciences and Physiotherapy, Ghent University, Belgium 2. Department of Rehabilitation Sciences and Physiotherapy, Ghent University, Belgium 3. Department of Rehabilitation Sciences, Faculty of Physical Education & Physiotherapy, Vrije Universiteit Brussel, Belgium 4. Department of Anesthesiology and Multidisciplinary Pain centre, University Hospital Ghent, Belgium 5. "Pain in Motion" research group, Faculty of Medicine and Health Sciences, University of Antwerp, Belgium

## INTRODUCTION

### Background

Fibromyalgia (FM) is a non-articular rheumatic disorder characterized by diffuse musculoskeletal pain and stiffness, often accompanied by fatigue. Ehlers-Danlos Syndrome (EDS) is the most prevalent heritable connective tissue disorder. In patients with EDS, more than 90% is classified with the hypermobility type. In clinical practice, deep breathing (DB) or programs including exercises with slow, controlled breathing are often used in these patients. The positive effects of DB on pain thresholds in healthy people are clear. However, in patients suffering from dysfunctional pain mechanisms and dysautonomia, the hypoalgesia induced by DB is not proven.

### Objective

Evaluation of the effect of DB on Pressure Pain Thresholds (PPTs) in FM patients and patients with Ehler Danlos hypermobility type (EDS-HT) compared to healthy controls.

## METHODS

### Subjects:

- 14 EDS-HT patients
- 9 FM patients
- 18 healthy controls

### Intervention:

- ✓ Before and after DB PPTs at M. Trapezius & M. Rectus Femoris with manual algometry



- ✓ 6' DB (6x/min) with visual feedback

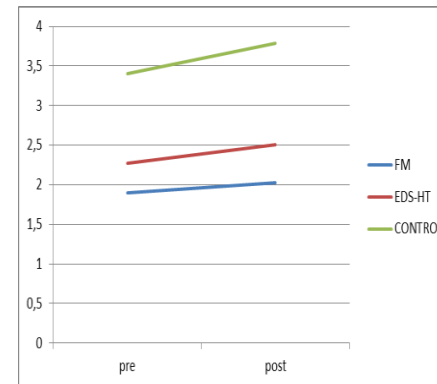


### Data analysis:

- ✓ The change in PPT measurements, prior to and after DB, were compared between the 3 groups with 2-factor repeated measures ANOVA with group (controls, EDS and FM) and time (pre- and post-deep breathing).

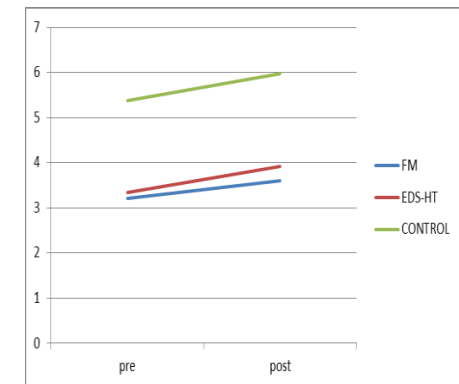
## RESULTS

Means of PPTs Trapezius prior and after DB



	P-value
DB	0,012*
DB * group	0,539

Means of PPTs Rectus Femoris prior and after DB



	P-value
DB	0,003*
DB * group	0,889

## CONTACT

Linda Hermans, PhD student  
Rehabilitation Sciences & Physiotherapy Ghent, Belgium  
Email: Linda.Hermans@ugent.be  
Phone: +32 (0)9 332 69 16  
Website: www.paininmotion.be



## DISCUSSION & CONCLUSION

As DB activates parasympathetic activity, an increase in PPTs was expected. However, several studies revealed impaired responses of the autonomic nervous system in FM and EDS-HT patients. Therefore, in these patients the hypoalgesia induced by DB was not obvious. The preliminary results of the current study clearly declare a positive effect of DB on PPTs in FM patients, patients with EDS-HT and healthy controls. A difference of DB-effect between groups was not found, possibly since the power was insufficient because of the small sample size. The results of the final study and future research is necessary to steer modalities of deep breathing.