

Effect of Sacroiliac Joint Mobilization on the Level of Soft Tissue Pain Threshold in Asymptomatic Women



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ABSTRACT

Objective: This study aimed to evaluate the effect of sacroiliac joint (SIJ) mobilization and/or self-mobilization on the level of soft tissue pain threshold in 21- to 23-year-old asymptomatic women ($n = 20$).

Methods: The FPIX Wagner Algometer was applied to compute the pressure pain threshold (PPT) over the right and left side of the iliolumbar ligament and lumbar erector spinae (L3). Measurements were taken of the right SIJ before and after a randomized protocol of oscillating mobilization, self-mobilization, and placebo treatment.

Results: A main effect of intervention (mobilization, self-mobilization, placebo) was confirmed by analysis of variance, with increases in PPT over the iliolumbar ligament ($F = 13.04, P < .05$) and erector spinae ($F = 12.28, P < .05$) on the mobilized side. The Wilcoxon test indicated that SIJ mobilization increased PPT over the iliolumbar ligament ($P < .05$) and erector spinae ($P < .05$) on both sides. Self-mobilization increased erector spinae PPT on the exercised side ($P < .05$), whereas the placebo did not cause any changes in PPT ($P > .05$).

Conclusion: The study provides evidence of local and global pain modulation resulting from oscillatory mobilization of the SIJ in women without pain symptoms. Self-mobilization of the SIJ has limited analgesic application. (*J Manipulative Physiol Ther* 2018;41:258-264)

Key Indexing Terms: *Pain; Pelvis; Spine; Therapeutics*

INTRODUCTION

The prevalence of low back pain in Europe and the United States is reportedly 49% to 70%.¹ Low back pain incidence increases throughout adolescence, occurring earlier in girls than in boys. Peak incidence occurs between the ages of 40 and 69 years and affects more females than males in all age groups.² In 13% of patients, it is caused by sacroiliac joint (SIJ) dysfunction.³

Mobilization of the spine is commonly prescribed by physiotherapists to treat neuromusculoskeletal disorders.⁴ The oscillating amplitude of mobilization can be quantified as large (grades II and III) or small (grades I and IV) as is relative to the available range of movement.⁵ Large-amplitude oscillations stimulate more mechanoreceptors and therefore are more effective at decreasing pain than small-amplitude oscillations.⁶ Current evidence indicates that manual therapy

has a moderate analgesic effect on pressure pain threshold (PPT) in patients with different forms of musculoskeletal pain.

Pressure pain threshold is often used as an outcome measure of various manual therapies on the modulation of pain.⁷ For example, the effects of a 30-second spinal mobilization (1 set) versus a high-velocity, low-amplitude manipulation on lumbar spine PPT were investigated in asymptomatic participants.⁸ There was no statistically significant change in PPT, although there was a trend for PPT to increase in the mobilization group compared with the high-velocity, low-amplitude manipulation and control groups. In another study, mobilization of the lumbar spine in asymptomatic persons did increase local and global PPT, although 4 sets of 30- to 60-second mobilization treatments were required,⁹ irrespective of mobilization rate (2 Hz, 1 Hz, and quasi-static)¹⁰ or amplitude (large- or small-amplitude oscillations and quasi-static).¹¹ Contrarily, SIJ manipulation did not significantly affect PPT over the posterior superior iliac spine (PSIS) in healthy women¹² but did significantly improve physical fitness (visual analog scale score), social function, mental health, and vitality in patients ($n = 18$) receiving manual therapy for SIJ-related leg pain.¹³

Considering the fact that mobilization of the lumbosacral spine region may lead to an increase in PPT,⁹⁻¹¹ it was hypothesized that grade III oscillatory mobilization and/or SIJ self-mobilization may cause an analgesic reaction in the lumbosacral region in participants without pain symptoms.

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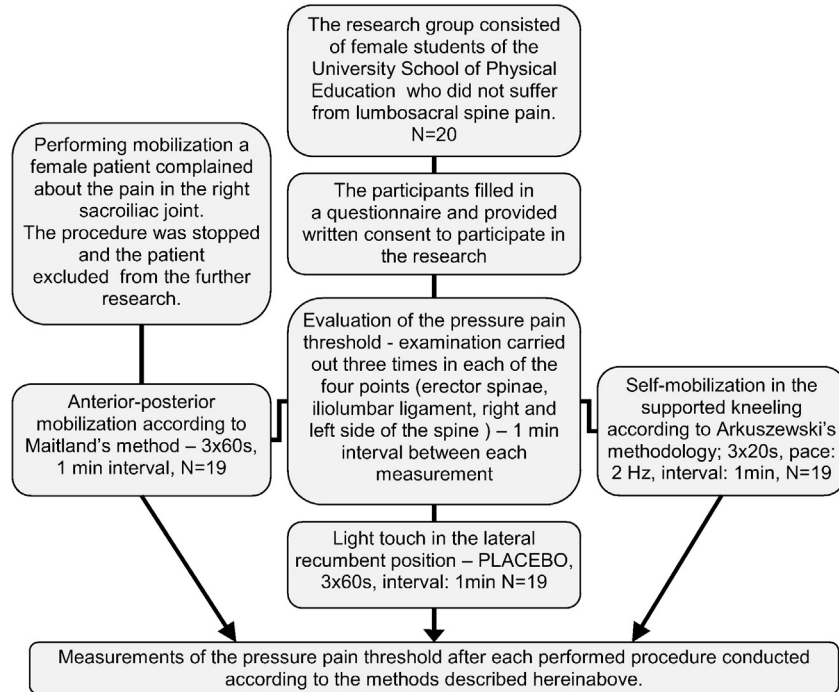


Fig 1. Study procedure.

The aim of the study was to determine the effect of mobilization and/or self-mobilization on PPT over the iliolumbar ligaments and erector spinae in their mobilized and immobilized parts. This study focused on the relationship between dosage and response as well as the cumulative effects of oscillatory mobilization, combined with active exercise via self-mobilization on soft tissue pain thresholds.

METHODS

Participants

The research group consisted of 20 women aged 21 to 23 years studying physiotherapy at the University School of Physical Education in Wroclaw, Poland. The study was approved by the Ethics Committee of the University School of Physical Education (December 22, 2014). Before examination, all participants provided written consent to participate in the study and completed a questionnaire of 22 items on spine-related pain and previous and current medical status. Questions also addressed musculoskeletal workload and the amount of daily physical activity. The questionnaire was for informational purposes only so as to aid the recruitment process. Inclusion criteria were lack of present-day lumbosacral pain and lack of pain while

mobilizing the SIJ. Orthopedic ailments, neurologic disorders, other injuries, and participation in extreme sports were set as the exclusion criteria.

Experimental Protocol

The study began with initial (baseline) PPT measurement followed by 3 stages, where each stage consisted of 1 type of manual therapy (oscillatory mobilization, self-mobilization, placebo) followed by PPT measurement (Fig 1). The intervention modalities were randomized to control for order effects or interaction between the 2 therapies. There was no additional break between the therapies besides the actual measurement because the primary goal was to study the cumulative effect of joint mobilization.

An FPIX Algometer (Wagner Instruments, Greenwich, Connecticut) was used to measure the PPT of the soft tissues over the lumbosacral region of the spine after each intervention. According to the International Association for the Study of Pain, PPT is the smallest stimulus causing the feeling of pain.¹⁴ Pressure pain threshold has had high Pearson correlation coefficients ranging from 0.65 to 0.96 for intrarater reliability and from 0.47 to 0.89 for interrater reliability^{15,16} as well as 0.90 to 0.99 for intra-observer reliability of 3 consecutive 10-second pressure measurements.¹⁷ As such, PPT has been established as a reliable

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