

Interest of the manual techniques in the treatment of low back pain

Anda Armeanca¹, Elena Sîrbu²

Abstract

Introduction: Low back pain (pain in the lumbar spine) is the most common complaint. About three in four adults will experience back pain during their lifetime—and that number may very well rise, given our aging population and recent trend of obesity. Low back pain affects the spine's flexibility, stability and strength, which can cause pain, discomfort and stiffness.

Aim: The aim of this study is to develop a rehabilitation program and to underline the importance of manual techniques in the treatment of patients suffering from low back pain. *Material and methods:* We investigated 7 women and 3 men aged between 38 and 53 years old, diagnosed with subacute low back pain documented by medical imagery. They were recruited in the service of Physical Medicine of the Liège University Hospital, Belgium. A battery of tests was developed to evaluate the effectiveness of this program. Each patient was evaluated during the first and the last (10th) rehabilitation session. *Results:* After the final evaluation, most results have improved significantly and this improvement is also marked by clinical tests. *Conclusions:* After 3 weeks of intervention we noticed a significant improvement at most of the parameters which means an increased life quality in patients with low back pain.

Key words: low back pain, manual techniques, rehabilitation program

Rezumat

Introducere: Durerea de spate (durere la nivelul coloanei lombare) este o afecțiune des întâlnită. Aproximativ trei din patru adulți vor experimenta de-a lungul vieții lor dureri de spate, iar numărul acestora ar putea crește având în vedere îmbătrânirea populației noastre și tendința recentă la obezitate. Lombalgia afectează flexibilitatea coloanei vertebrale, stabilitatea și forța, ceea ce poate cauza dureri, discomfort și rigiditate. *Scop:* Scopul acestui studiu este de a propune un program de recuperare adecvat și de a sublinia importanța tehnicilor manuale în reabilitarea pacienților cu lombalgie. *Material și metoda:* Au fost luați în studiu 7 femei și 3 bărbați cu vârsta cuprinsă între 38 și 53 de ani, diagnosticați cu lombalgie subacută prin tehnici de imaginerie medicală. Ei au fost recrutați din serviciul de Fizioterapie al Spitalului Universitar din Liège. O baterie de teste au fost folosite pentru a evalua eficiența acestui program. Fiecare pacient a fost evaluat în timpul primei și a celei de-a zecea, respectiv ultimei ședințe de kinetoterapie. *Rezultate:* La finalul ultimei evaluări, s-a observat că majoritatea rezultatelor s-au îmbunătățit semnificativ, iar această ameliorare este susținută și de testele clinice. *Concluzii:* După 3 săptămâni de reeducare

¹ Master Student, Physical therapist, Physical Education and Sport Faculty, West University of Timișoara, e-mail:andaram@yahoo.com

² MD PhD Assoc. Lecturer, Physical Education and Sport Faculty, West University of Timișoara, Resident doctor, Municipal Clinical Hospital Timișoara

am observat o îmbunătățire semnificativă a celor mai mulți parametri, ceea ce înseamnă o mai bună calitate a vieții la pacienții care suferă de lombalgie.

Cuvinte cheie: lombalgie, tehnici manuale, program de recuperare

Introduction

Low back pain is one of the most common problems people have. About 60 - 80% of the adult U.S. population has low back pain, and it is the second most common reason people go to the doctor. Back pain is the leading cause of disability in adults under 45 years old. Each year 13 million people go to the doctor for chronic back pain. Most back pain can be prevented by keeping your back muscles strong and making sure you practice good mechanics (like lifting heavy objects in a way that won't strain your back). There are still some years, some authors thought that sciatica could occur in case of nerve root swollen, stretched or compressed. Currently, if there is a disco-radicular conflict, the authors believe that is a chemical conflict and mechanical conflict. The mechanical conflict corresponds to compression or traction of the nerve root [1, 2].

The chemical conflict is related to chemical studies of the herniated material, which revealed the presence of:

- Inflammatory cells,
- Growth factors,
- Enzymes of the local inflammation,
- Cytokines
- Metalloprotease.

Now is obvious that the sciatica can occur when there is no direct nerve compression [2].

Aim

The aim of this study is to develop a rehabilitation program and to underline the importance of manual

techniques in the treatment of patients suffering of low back pain.

Material and methods

The prospective study was conducted on 7 women and 3 men aged between 38 and 53 years old, diagnosed with subacute low back pain documented by medical imagery. They were recruited in the service of Physical Medicine of the Liège University Hospital. Physical therapy was performed for 3 weeks and each patient received three sessions of physiotherapy per week. The main criteria for inclusion were: trochanteric pelvic irradiation, sciatica up to mid-tight or knee. Medical imagery had to confirm medical condition such as: arthrosis, degenerative discopathy, disc protrusion, lumbar disc herniation etc. Exclusion criteria were: lumbar and sacral fractures, lumbar disc herniation in acute phase, narrow lumbar canal, tumor processes. Each therapy session consisted in:

- tractions/pulls,
- passive mobilization of the lumbar area and of the sacroiliac joints,
- muscle stretching,
- muscle reinforcement and axial isometry (self expansion, techniques of irradiation, "gainage" exercises, proprioceptive exercises).

We used a battery of tests in order to evaluate the effectiveness of this program. Each patient was evaluated before the first and after the 10th (last) rehabilitation session.

Assessment of lumbo-pelvic-trochanterien mobility

was done with the following tests:

- *modified Schober test* evaluates the flexibility of the lumbar spine in flexion. The skin marks used are the spaces L5/S1. We mark a line at 10 cm over and another 5cm below this space. The patient standing, arms along the body, feet joined, leans forward as far as possible, maintaining all the time legs outstretched. With a measuring tape, the assessor measures the distance between L5/S1-5 cm and the distance between L5/S1+10 cm. In case of normal flexibility, the distance exceeds 15 cm, with a value between 19.5 and 21 cm.
- *Double inclinometers*. The patient heats by performing a few flexion-extension movements. We place the inclinometers at the D12/L1 and S2. The patient standing, arms along the body, feet slightly apart, leans forward as far as possible, maintaining all the time legs outstretched. The amplitude of lumbar flexion is obtained by subtracting the measurement of the inferior inclinometer (pelvic mobility) of the D12/L1 (lumbar and pelvic additional mobility). The lumbar and pelvic mobility reach in average 55° [2, 3].
- *Lateral tilt*: This test assesses the movements of lateral bending in the thoraco-lumbar spine. The patient standing, arms along the body, feet joined, leans on the side leaving the hand down along the thigh. When it reaches the amplitude maximum, the assessor measure the distance remaining between the tip of the medium and the knee external interline. This distance is considered positive when the tip of middle finger rest on top of the knee external interlines [4]. This measurement is made on a bilateral basis in order to compare healthy and pathological side.
- *Muscle and ligament imbalance* (flexibility of the psoas in supine position): the patient is placed

supine, buttocks at the edge of table. It keeps the untested knee bended on his stomach. We used a goniometer for measuring the angle between the horizontal and the tight. The center of the goniometer was placed at the greater trochanter, one branch it is superimposed on the thigh and the other is maintained at the horizontal. The angle is considerate as positive when the tight is beneath horizontal and negative when it is below. The standard is 15° beneath horizontal. The two sides are tested.

- *Lasègue supine*: The patient is placed supine, buttocks at the edge of table. We took the posterior face of the ankle and we lift the lower limb tested until the patient feels a tension on the back of the thigh, radiating pain, or to see a clearing in the pelvis. The two sides are tested [5]. Assessment is by two scales: 1. triggering of pain: yes/no and 2. the measuring of the angle with a goniometer;
- *Lasègue seated*: The patient is sitting on the table, both knees bended and the feet into the void, the upper limbs are folded across the chest. He is asked to flex her hip with the leg extended at the knee [5]. The two sides are tested. Assessment is by two scales: 1. triggering of pain: yes/no and 2. the measuring of the angle with a goniometer;
- *Visual Analogue Scale*: This scale represents a horizontal line non-graduated of 10 cm, limited at its ends by items "no pain" and "worst pain imaginable". A cursor allows the patient to place his pain. On the other side of the scale, the physiotherapist has a graduated scale from one to ten. The question posed to the patient is "how much would you rate your pain today?" The patient move the cursor and the physiotherapist note the numerical value obtained on the other side of the scale [6].

Results and discussion

Using the paired t test to compare the data at baseline and after each therapy session we noticed a significant differences in 6 tests. We noticed a significant improvement in the flexibility of lumbar spine ($p=0,05$). In the sagittal plan the patients have a slight mobility deficit and even after the rehabilitation program they maintained the lack of mobility at the pelvic level ($p=0,09$).

We noticed that all patients could perform better movements of lateral bending in the thoraco-lumbar spine and especially on the right side ($p=0,009$).

Evaluation of the flexibility of the psoas shows a clear improvement on both sides ($p=0,002$). These results could be explained by the many stretches maneuvers performed in our rehabilitation program. Lasegue supine test showed no pain when the leg was raised to an angle of at least 80° above the horizontal. Lasegue sitting test has a deficit on the painful side during the initial evaluation and then returns to normal during the final evaluations. At the 10th session of rehabilitation patients is better, the pain and functional disability decreased significantly.

Tabel 1. Arithmetic mean and paired t test of the studied parameters

Parameters		Baseline	After 3 weeks of intervention	p value
Modified Schober Test	-	18.7	21.2	0.05
	pelvic mobility	40	44.5	0.09
Double inclinometers	lumbar mobility	39.4	45	0.02
Lateral tilt	right	-1	-1.2	0.009
	left	0.7	-2.86	0.02
Flexibility of psoas supine	right lower limb	20	-9.9	0.002
	left lower limb	12.2	-7.6	0.002
Lasègue supine	right lower limb	66.6	80.8	0.002
	left lower limb	81.5	87.4	0.05
Lasègue seated	right lower limb	7.9	0	0.03
	left lower limb	-7.2	-2.4	0.03
Visual Analogue Scale	-	4.14	1.73	0.001

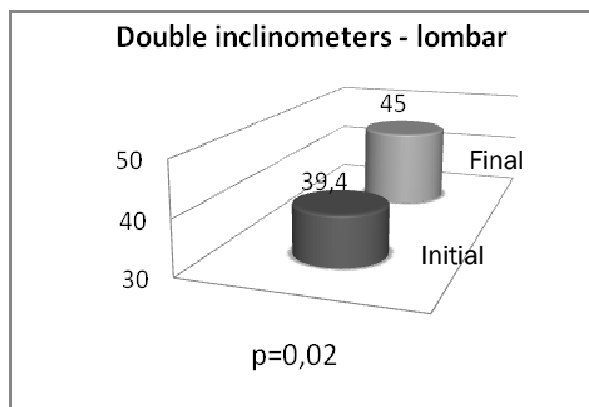
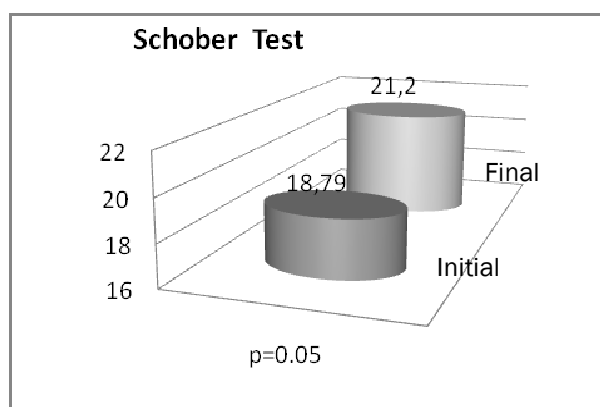


Figure 1. The arithmetic mean and paired t test of Schober

Figure 2. The arithmetic mean and paired t test of double

Test

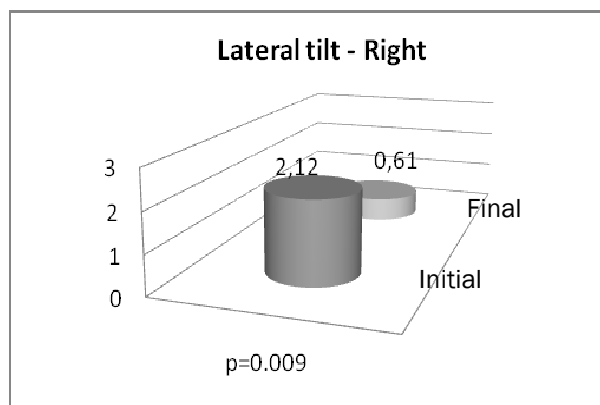


Figure 3. The arithmetic mean and paired t test of lateral tilt

inclinometers

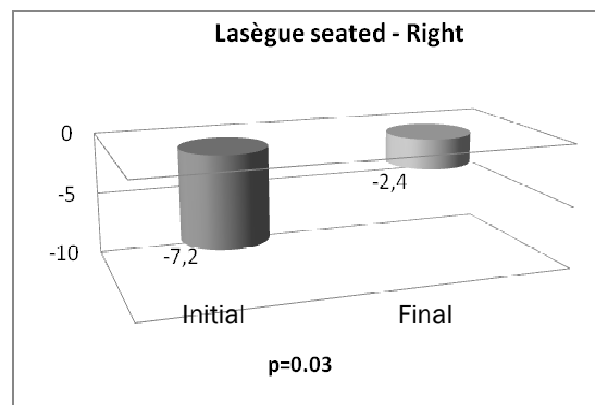


Figure 6. The arithmetic mean and paired t test of Lasègue seates

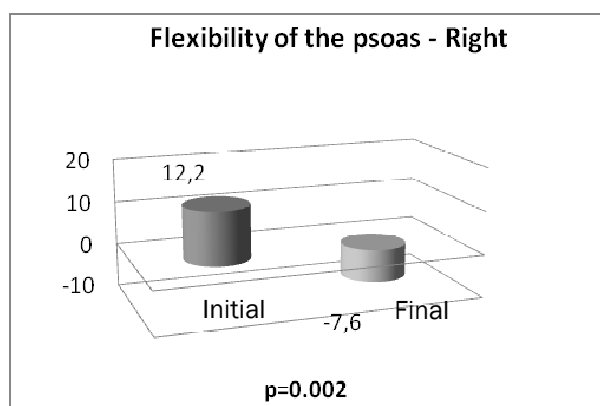


Figure 4. The arithmetic mean and paired t test of psoas

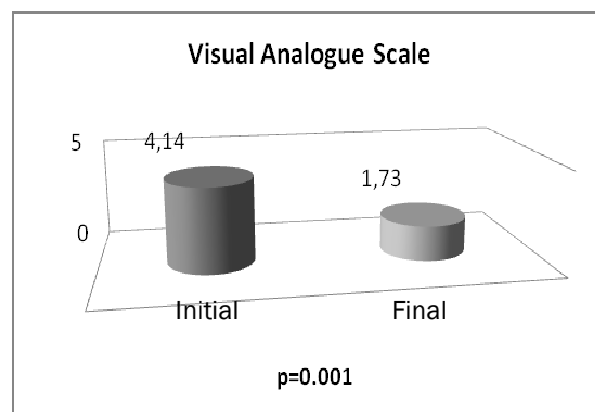


Figure 7. The arithmetic mean and paired t test of Visual Analogue Scale

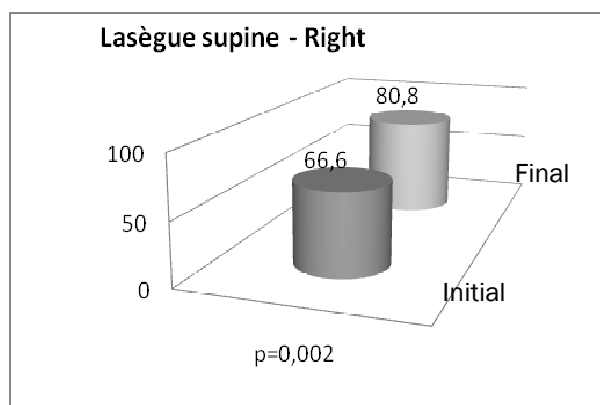


Figure 5. The arithmetic mean and paired t test of Lasègue supine

Conclusions

Physical Therapy is often prescribed for patients with back pain and other spinal problems. Patients suffering from low back pain are often referred for physical therapy for four weeks as an initial conservative (nonsurgical) treatment option before considering other more aggressive treatments [7]. The goals of physical therapy are to decrease back pain, increase function and teach the patient a maintenance program to prevent future back problems [8].

We tried to make an original treatment plan, including full and progressive techniques (tractions,

passive mobilization of the lumbar area and of the sacroiliac joints, muscle stretching, muscle reinforcement and axial isometry etc).

After 3 weeks of intervention we noticed a significant improvement at most of the parameters (spine's flexibility, stability and muscle strength) which means an increased life quality in patients with low back pain. After the last evaluation patients had better clinical outcomes, the pain and functional disability decreased significantly.

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