

## PHYSICAL THERAPY APPROACHES IN TREATMENT OF SACROILIAC JOINT DYSFUNCTION

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### Abstract

**Introduction:** Through the ages sacroiliac joint (SIJ) dysfunction as a source of low back pain (LBP) has been evolved from unrecognized and neglected to a main source in 13% of the population (Schwarzer et al., 1995) or 19% (1995) and 15% (Bogduk et al., 2002). Although there is no widely adopted treatment protocol, the preferred approach is conservative including: electrotherapy, laser therapy, ultrasound, medications, rest, exercise, manual mobilizations and/or manipulations, acupuncture. **Aim:** The aim of this study was to compare the effects of two treatment programs. **Material and methods:** Total of 64 patients with pain in the lumbosacral region due to SIJ dysfunction were treated. Divided in two group B (experimental n=41) and V (controlled n=23). The controlled group underwent treatment consisting of classic massage, core stability exercise on stable surface, home exercise program auto-mobilization and for the experimental - manipulative massage, manual mobilizations of SIJ, core stability exercise with fitness ball. **Results and conclusion:** The positive influence of the therapy was common for the both groups but more noticeable in the experimental. This method demonstrate the normalizing effect on the dysfunction of the pelvic girdle, reduction of muscle imbalance, decreased subjective complaints and symptoms of pain -(VAS  $\pm 0.43$ , SEP  $\pm 0.23$  and LP  $\pm 0.70$ ).

**Key words:** LBP, manipulative, mobilizing, massage, exercise, dysfunction, sacroiliac joint

### Introduction

As with the development of thought about the influence of this joint to the onset of pain in LBP, so with the treatment approaches, there is no widely adopted consensus. In late years the fabric of treatment becomes more and more colorful but with little change in the dominating colors. Prevalent treatment methods are electrotherapy, laser therapy, exercise, rest, advice, manual manipulation and/or mobilization. Researchers in the fields suggest and advise the use different means. Melzack and Wall (1996) suggest treatment of trigger points for addressing the pain.

The authors claim that there is no process that does not include activation of these points. L. Kraydzhikova (2000) prefers the mobilizing and/or manipulative massage over the classical. Combining the movements with passive stretching improves the local trophicity, muscle tone and proprioception. For addressing the muscle imbalance, a good effect can be achieved with exercises with fitness ball (V. Zhelev & E. Lianu 2004), (Rafael F. Escamilla et al. 2010). Whatever the chosen method be, it should address the pain, local tissue pathology and general biomechanics thru achieving balance between stability and mobility and proper proprioceptive control. For finding the optimal combination of means to resolve the mentioned tasks, more research is needed.

### Aim

The aim of this study was to test and compare the effect of two physical therapy programs designed for treating lumbosacral pain due to sacroiliac joint dysfunction.

### Material and methods

In the period of 2009 – 2012 on the premises of the Recreational center of University "Goce Delcev" – Štip a total of 64 patients with pain in the lumbosacral region due to SIJ dysfunction. The patients were divided in two group B - (experimental n=41) and V - (controlled n=23). The gender distribution and average age of the two groups is shown in Table 1.

Table 1. Gender distribution of two groups

	Group B (n= 41)	Group V (n= 23)
Male	18	9
Female	23	14
Joints	66	35
Average age	41	38

The controlled group underwent treatment consisting of classic massage, core stability exercise on stable surface, home exercise program for auto-mobilization of SIJ and for the experimental - manipulative massage, manual mobilizations of SIJ, trigger point release, core stability exercise with fitness ball. During a 14 day period patients from both groups had 10 treatment sessions. For the assessment of the effects of the therapy we comprised a test battery including diagnostic tests: Laguerre Test (LT), Iliac Compression Test (ICT), Derbolowsky sign (DS), Sacroiliac Mobilization Test (SMT), tests for pain: Visual analog scale (VAS), test for Subjective evaluation of pain (SEP), Merl d`Aubine's classic test, modified by D. Kostadinov (1978) and test for localization of pain (LP) by S. Stoyanova (1978), modified by L. Kraydzhikova (1999) in accordance to the pathokinesiologic analysis of the SIJ.

For assessment of the muscle strength the standard Manual muscle test (MMT) was used and for static strength endurance (SSE) by V. Zhelev, H. Voyadzis and E. Lianu (2004), that consists of nine position that are measured in seconds. Measurements were taken at the start of the therapeutic program and at the end after the tenth session. For assessment of relapses we used the Roland – Morris questionnaire for low back pain. The patients filled three forms, at the start, at the end and three months after the therapy session.

**Results and discussion**

Figure 1 shows the results of the diagnostic test. For both groups they are almost identical. LT, ICT and SMT values are B=66 and V=35 affected joints at the end no dysfunctional joint was registered, an improvement of 100%. The Derbolowsky sign's values were B=23 and V=10 at the beginning and at the end only one dysfunctional joint was registered in the experimental group. The percentage of improvement in all of the diagnostic test shows the positive effect of the mobilization techniques and other passive means. The aim of these means is to relax and stretch the soft tissues and by that facilitating the joint mobility.

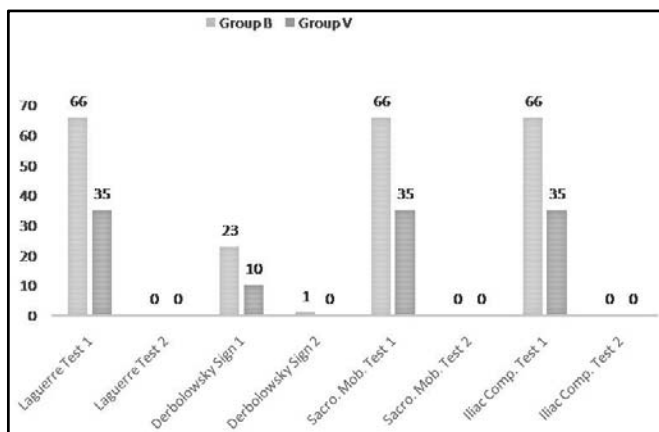


Figure 1. Number of diagnosed dysfunction sacroiliac joints per group

Table 2. Comparison of the results of tests for the assessment of pain: VAS – Visual analogue scale, SEP - Subjective evaluation of the degree of pain, LP - localization of pain

Test	VAS		SEP		LP	
	B	V	B	V	B	V
Group						
N	41	23	41	23	41	23
X1	8,97	8,65	2,09	2,13	2,29	2,39
X2	1,24	1,34	4,8	4,60	4,73	4,13
X2-X1	7,73	7,30	2,70	2,47	2,43	1,73
±S (X2-X1)	1,26	1,39	1,03	0,94	0,89	0,81
t	39,12	25,09	16,82	12,54	17,43	10,29
Df	40	22	40	22	40	22
p	0,00	0,00	0,00	0,00	0,00	0,00

Normalization of joint mechanics improves the trophicity of its structures, the proprioception and prevents relapses. The most evident effect is manifested by reduction of pain (Table 2, Figure 2).

Analgesic effect was manifested in all patients but slightly better in the experimental group (VAS ±0.43, SEP ±0.23 and LP ±0.70). The degree of pain measured at the end of the therapeutic course was inconsistent and it didn't require medications.

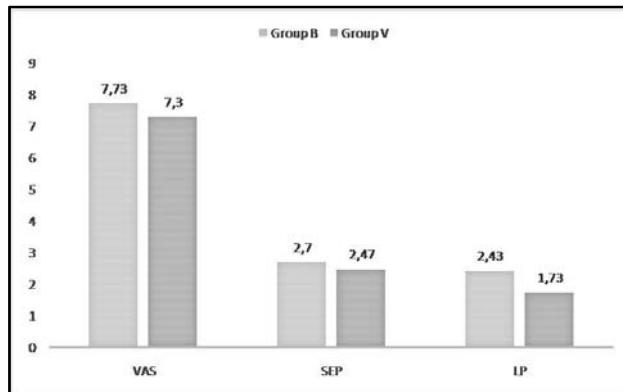


Figure 2. Comparison of the differences of the test results for the assessment of pain

The results of the first MMT measurement (Table 3, Chart 3) showed decreased muscle strength that influences normal biomechanics of the pelvic girdle as a whole and the joint play of the SIJs as its center. The exercise complex gave positive feedback in both groups but slightly more prominent in the experimental (Left hip ext. (+0.39), right hip ext. (+0.30), muscles of the back (+0.16) and abdominals (+0.13).

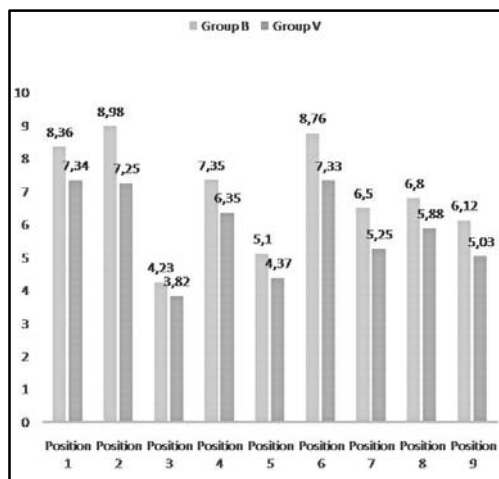


Figure 3. Comparison of the increase of muscle strength

Muscle strength, balance and endurance are crucial factors for normal function of any kinematic complex, especially one as complexed as the pelvis. For evaluation of the static strength endurance we used a test consisting of nine positions in which the patient is placed and holds for maximum amount of time, measured in seconds. The results of this test are shown in Table 4, Chart 4. The lowest results were registered in the first (B=11.66, V=11.69), third (B=11.41, V=11.63), fifth (B=11.24, V=11.22), eighth (B=6.01, V=6.19) and ninth (B=6.70, V=6.73) position.

These muscles correspond with the ones included in the MMT, muscles that form the corset and give stability to the lumbar region and pelvis. The low results are due to the increase of pain in these positions. Second assessment of the static strength endurance showed increase in all test position in both groups. The results also confirmed the restoration of muscle balance

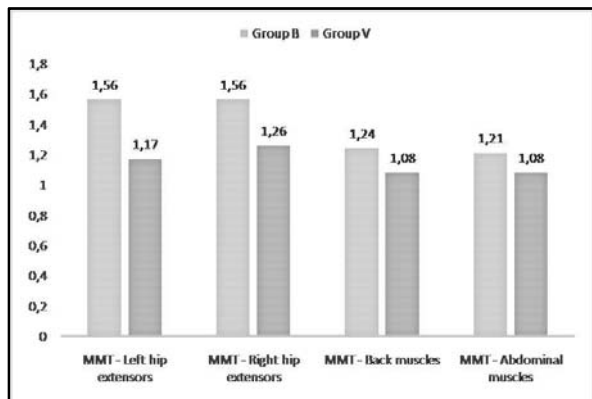


Figure 4. Comparison of the gained difference of the static strength endurance test (in seconds)

The results of the Rolland – Morris questionnaire are shown in Table 5, Chart 5. Group B started with an average of 16.27 and Group V with 15.73 points. At the end of the therapy course the values decrease to B=2.56 and V=3.23 which represent 84.26% for B and 79.46% improvement. This confirms the positive influence of the experimental approach.

For the 3 month follow-up we send questionnaires to the patients of both groups. Only 12 patients from Group B and 7 from Group V responded. The results from this follow-up showed slight increase with values of B=5.14 and V=4.05. The home therapy program for auto mobilization helped to sustain the effects of the treatment and prevent relapses.

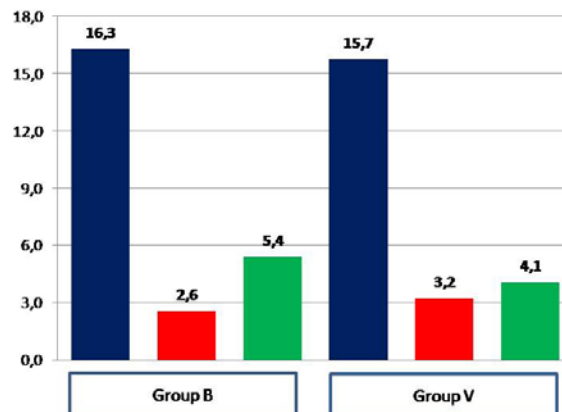


Figure 5. Comparison of the results of the Rolland – Morris questionnaire (start, end, 3 mon. follow up)

Table 5. Comparison of the results of the Rolland – Morris low back pain and disability questionnaire

No.	Group B	Group V
Start	16.27	15.73
End	2.56	3.23
3 month follow up	5.14	4.05

Table 3. Comparison of the results of the manual muscle testing (MMT)

Test	Group	N	X1	X2	X2-X1	±S (X2-X1)	t	Df	p
MMT left hip extensors	B	41	3.21	4.78	1.56	0.54	18.17	40	0,00
	V	23	3.39	4.56	1.17	0.65	8.65	22	0,00
MMT right hip extensors	B	41	3.26	4.82	1.56	0.63	15.75	40	0,00
	V	23	3.39	4.65	1.26	0.61	9.76	22	0,00
MMT muscles of the back	B	41	3,65	4,90	1,24	0,62	12,77	40	0,00
	V	23	3,60	4,96	1,08	0,66	7,80	22	0,00
MMT abdominal muscles	B	41	3,68	4,90	1,21	0,57	13,68	40	0,00
	V	23	3,69	4,78	1,08	0,59	8,74	22	0,00

Table 4. Comparison of the results of the static strength endurance test (SSE)

Test	Group	N	X1	X2	X2-X1	±S (X2-X1)	t	Df	p
P1	B	41	11,66	20,03	8,36	2,61	20,47	40	0,00
	V	23	11,69	19,03	7,34	2,48	14,17	22	0,00
P2	B	41	16,35	25,34	8,98	2,44	23,56	40	0,00
	V	23	16,10	23,35	7,25	2,25	15,42	22	0,00
P3	B	41	11,41	15,65	4,23	1,57	17,25	40	0,00
	V	23	11,63	15,45	3,82	2,16	8,47	22	0,00
P4	B	41	16,29	23,64	7,35	2,33	20,14	40	0,00
	V	23	15,65	22,01	6,35	2,21	13,73	22	0,00
P5	B	41	11,24	16,35	5,10	1,83	17,82	40	0,00
	V	23	11,22	15,60	4,37	1,66	12,57	22	0,00
P6	B	41	15,43	24,20	8,76	2,13	26,35	40	0,00
	V	23	15,52	22,85	7,33	2,43	14,42	22	0,00
P7	B	41	15,88	22,38	6,50	2,05	20,26	40	0,00
	V	23	16,30	21,55	5,25	2,57	9,79	22	0,00
P8	B	41	6,01	12,81	6,80	1,42	30,53	40	0,00
	V	23	6,19	12,07	5,88	1,68	16,71	22	0,00
P9	B	41	6,70	12,82	6,12	1,52	25,63	40	0,00
	V	23	6,73	11,77	5,03	1,69	14,26	22	0,00

## Conclusion

Taken in consideration the available literature, current research and personal experience, we can conclude that rational approach to treating SIJ dysfunction should include identification of all affected structures, tissues and risk factors. Identifying the interactions and influences between them will give a clearer picture about the pathogenesis of the disorders. Thus chosen treatment methods should include means that will address all issues that will rise during the

evaluation and assessment. As shown in the results above, the use of manipulative massage, trigger points release – for pain reduction, manual mobilization – for restoring the normal joint play and exercises for restoring the global biomechanics and function of the pelvic girdle and its structures is a move in a right direction for optimization of the treatment approach.

Every treatment should include a training program in ergonomics of daily activities and guidelines for reduction of risk factors and prevention of relapses.

## References

- Bogduk, N., & McGuirk, B. (eds). Causes and sources of chronic low back pain. In *Medical Management of acute and Chronic Low Back pain. An Evidence-Based Approach: Pain Research and Clinical Management*, Vol. 13, Elsevier Science BV, Amsterdam, 2002, (pp 115-126).
- Escamilla, R.F., Lewis, C., Bell, D., Bramblett, G., Daffron, J., Lambert, S., Pescon, A., Imamura, R., Paulos, L., & Andrews, J.R. (2010). Core Muscle Activation During Swiss Ball and Traditional Abdominal Exercises. *Journal of orthopaedic & sports physical therapy*, 40(5), 265-275.
- Schwarzer, A.C., Aprill, C.N., & Bogduk, M. (1995). The sacroiliac joint in chronic low back pain. *Spine*, 20, 31-37.
- Wall, P., & Melzack, R. (1996). *The challenge of Pain*. London: Penguin book.
- Желев, В., & Лиану, Е. (2004). Упражнения на Швейцарска топка (Swiss – Ball) за лумбална дискова болест. София: Авангард.
- Костадинов Д. Степенуване (тестуване) на някои функции и симптоми при заболяване на ставно – свързочния апарат. – София: Културология, физиотерапия и лечебна физкултура, 1978.
- Крайджикова, Л. Методика за функционално възстановяване на сакроилиачна става, С и Н, 1999.
- Крайджикова, Л. Мускулен дисбаланс – функционално изследване на кинезитерапевтичното лечение. Монография. НСА Прес, 2000.
- \* \* \* (2015). *Roland Morris Disability Questionnaire*. <http://www.rmdq.org/Download.htm> (January, 2015).
- \* \* \* (2015). *Physiopedia*. [http://www.physio-pedia.com/Roland%E2%80%9090Morris\\_Disability\\_Questionnaire](http://www.physio-pedia.com/Roland%E2%80%9090Morris_Disability_Questionnaire) (January, 2015).

## FIZIOTERAPEUTSKI PRISTUP U TRETIRANJU NARUŠENE FUNKCIJE SAKROILIAKALNOG ZGLOBA

### Sažetak

*Uvod: Kroz stoljeća disfunkcije sakroilijačnih zglobova kao izvor križobolje je evoluiralo od neprepoznatljivosti i zanemarjivosti, do glavnog izvora boli 13% populacije (Schwarzer, 1995) ili 19% (1995) i 15% (Bogduk, 2002). Iako ne postoji široko usvojen protokol za tretman, poželjan pristup je konzervativan, uključujući: elektroterapiju, laserske terapije, ultrazvuk, lijekove, odmor, vježbe, ručne mobilizaciju i/ili manipulaciju, akupunkturu. Cilj: Cilj ovog istraživanja je usporediti učinke dvaju programa liječenja. Materijal i metode: Ukupno 64 bolesnika s boli u lumbosakralnoj regiji zbog disfunkcije sakroilijačnih zglobova je tretirano. Podijeljeni su u dvije skupine „B“ (eksperimentalna, N = 41) i „V“ (kontrolna, N = 23). Kontrolna skupina je prošla tretman koji se sastojao od klasične masaže, vježbi za stabilizaciju na stabilnoj površini, kućni program vježbanja auto-mobilizacije i eksperimentalno-manipulativnu masažu, ručnu mobilizaciju sakroilijačnih zglobova, vježbe za stabilizaciju na fitness lopti. Zaključak: Pozitivan utjecaj terapije je zajednički za obje skupine, ali više vidljiv kod eksperimentalne. Ova metoda je dala učinak u normalizaciju funkcije lumbalne kralježnice i karlice, smanjena je mišićna neravnoteža, smanjene su subjektivne pritužbe i simptomi boli - (VAS ± 0,43, SEP ± 0,23 i 0,70 ± LP).*

**Ključne riječi:** manipulativno, mobiliziranje, masaža, vježbe, disfunkcija, sakroilijačni zglobovi

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