Received: 23.12.2010 / **Accepted:** 22.08.2011

DOI: 10.5137/1019-5149.JTN.4057-10.1

Effectiveness of Lumbar Zygapophysial Joint Blockage for Low Back Pain

Bel Ağrısında Lomber Zigapofizeal Eklem Blokajının Etkinliği

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ABSTRACT

AIM: Zygapophysial joints have been a well-recognized source of low back pain. This paper compares the efficacy of lumbar zygapophysial joints blockage and medical therapy in terms of pain relief, loss of working days and recurrence of pain in a population with mechanical low back pain.

MATERIAL and METHODS: 80 patients suffering from low back pain were included in the study. Patients were divided into 2 groups. Patients in Group I were given diclofenac sodium, thiocolchicoside and were recommended bed rest. Patients in Group II received zygapophysial joints blockage by prilocaine, bupivacaine and methylprednisolone acetate. Both of the groups were evaluated with a Oswestry low back pain disability questionnaire and visual analog scale for pain.

RESULTS: Posttreatment VAS and ODQ scores were significantly lower than pretreatment scores. The decrease in these scores in Group II was greater than those of Group I.

CONCLUSION: Blockage of the lumbar facet joints is a rapid and effective way to reduce pain originating from lumbar facet joints.

KEYWORDS: Facet joint blockage, Low back pain, Lumbar spine, Zygapophysial joint blockage

ÖZ

AMAÇ: Zigapofizeal eklemler iyi bilinen bel ağrısı kaynaklarıdır. Bu yazıda lomber zigapofizeal eklem blokajının mekanik bel ağrısı yakınması olan bir hasta topluluğunda ağrı giderilmesi, iş gücü kaybı ve nüks yönünden tıbbi tedavi ile karşılaştırılması amaçlanmıştır.

YÖNTEM ve GEREÇLER: Bel ağrısı yakınması olan 80 hasta çalışmaya alınmıştır. Hastalar iki gruba ayrılmıştır. Grup I'deki hastalara diclofenac sodium, thiocolchicoside verilmiş ve istirahat önerilmiştir. Grup II'deki hastalara ise prilocaine, bupivacaine ve methylprednisolone acetate ile zigapofizeal eklem blokajı yapılmıştır. Değerlendirme için Oswestry bel ağrısı özürlülük sorgulaması ve görsel analog skala kullanılmıştır.

BULGULAR: Tedavi sonrası VAS ve ODQ skorları istatistiksel olarak tedavi öncesi skorlardan düşük olarak bulundu. Grup II'deki düşüş Grup I'e göre daha fazlaydı.

SONUÇ: Lomber faset eklemleri blokajı bu bölgeden kaynaklanan bel ağrısının giderilmesinde etkili ve hızlı bir tedavi şeklidir.

ANAHTAR SÖZCÜKLER: Bel ağrısı, Faset eklem blokajı, Lomber omurga, Zigapofizeal eklem blokajı

INTRODUCTION

Low back pain (LBP) is an exceptionally prevalent worldwide condition and is the second most frequent reason for people to seeking medical attention from a primary care physician (21). The lifetime prevalence of LBP ranges from 60% to 90%, whereas the annual incidence is approximately 5% (4). The accurate etiology of LBP can be identified in 15% of cases only. Mechanical causes account for 97% of patients with LBP (7). Acute LBP lasts more than 3 months in 7 to 10% of patients and becomes chronic. Zygapophysial joints in the lumbar region have been a well-recognized source of pain in patients with persistent LBP since 1911 (1,5,19). This opinion gained popularity until Mixter and Barr published an article that claimed that a ruptured intervertebral disc was the main cause of LBP (13). Interest was revived after 1971 when Rees reported a 99.9% success rate in treating LBP with denervation of the lumbar zygapophysial joint percutaneously (15). Since then, numerous operative techniques for denervation of the lumbar zygapophysial joints have been developed by neurosurgeons, orthopedic surgeons and anesthesiologists. This paper compares the efficacy of lumbar zygapophysial joints blockage and medical therapy with bed rest in terms of pain relief, loss of working days and recurrence of pain in a patient population with mechanical low back pain and without any surgical lumbar pathologies.

MATERIAL and METHODS

After obtaining Ethics Committee approval registration number 02022009-001, 80 consecutive patients were included in the study between January and March 2009. Criteria for inclusion were as follows:

1. Aged between 20-60, male or female patients.
2. The patients suffered low back pain, but no extensions of pain to the legs.
3. Patient pain was exacerbated with hyperextension and alleviated by flexion.
4. Patient had maximally a 4-month history of pain.

Criteria for exclusions were as follows:

1. Patients with lumbar pathologies diagnosed by radiology such as lumbar herniated disc disease, spondylolisthesis, narrow spinal canal, scoliosis or other spinal deformities, fracture, mass lesions etc.
2. Patients with a history of major or radiologically demonstrable lumbar trauma.
3. Patients with radiologically demonstrated lumbar facet arthropathy, black disc or MODIC changes.
4. Patients with pathologies diagnosed by EMG such as mononeuropathies, polyneuropathies, and compression neuropathies or have a finding for root or nerve compression.
5. Patients with a history of previous lumbar surgery.
6. Patients with a metabolic bone disease.
7. Patients with a history of rheumatoid disease.
8. Patients with a serious systematic disease such as uncontrolled diabetes mellitus, chronic kidney failure, hypertension, chronic obstructive pulmonary disease, cardiac failure.
9. Patients with a neoplastic disease.
10. Patients with a psychiatric disease.
11. Patients have a sciatalgia, radiculopathy, neurological deficits.
12. Patients with an epileptic or severe neurological disease.
13. Child bearing women and suspicion of pregnancy.
14. Patients with a skin lesion on the lumbar area or systematic dermatological disease.
15. Patients with a venous failure on their legs.
16. Patients with a previously diagnosed surgical lumbar disease even if surgery was not performed.

Detailed anamneses were obtained from all patients and physical examinations, and musculoskeletal and neurological examinations were performed. History of trauma, pain characteristics and demographic features such as sex, age, weight, height, education level, occupation were collected.

A radiological examination was performed by direct roentgenograms and lumbar spinal MRI. Patients with suitable criteria for inclusion were divided randomly into 2 groups of 40.

Patients in Group I were given diclofenac sodium (Diclofam-Berksam Ilac Ticaret AS, Istanbul-30.01.1997-181/46) 100 mg/day, thiocolchicoside (Thiospa-Eczacibasi Ilac Sanayi ve Ticaret AS, Luleburgaz-02.02.2006-207/41) 8 mg/day for 5 days and were recommended bed rest for 4 days. Patients in Group II received bilateral L4/5 and L5/S1 zygapophysial joints blockage percutaneously with 22 G spinal needle by prilocaine (Citanest-Astra Zeneca Ilac Sanayi ve Ticaret AS, Luleburgaz-21.01.2000-194/78) 10 mg bupivacaine (Marcaine-Astra Zeneca Ilac Sanayi ve Ticaret AS, Luleburgaz-21.01.2000-194/85) 5 mg and methylprednisolone acetate (DepoMedrol- Eczacibasi Ilac Sanayi ve Ticaret AS, Luleburgaz-05.08.1968-92/63) under PA and lateral fluoroscopy. After the procedure was completed, patients were discharged without recommendation for bed rest.

Both of the groups were evaluated with a modified Oswestry low back pain disability questionnaire (ODQ) and visual analog scale for pain (VAS). The results of these scales for patients in Group I were collected before bed rest and medication, on the first and fifth days, and in the first, third and sixth months after the end of treatment; and for patients in Group II before performing the blockage, on the first day, and in the first, third and sixth months after the procedure.

Statistical analyses were performed by Statistical Package for the Social Sciences (SPSS) for Windows version 11.5 (SPSS Inc., Chicago, IL, USA). Descriptive statistics were given as mean ± standard deviation (SD) for continuous variables, percentage of median for arranged variables and number of cases and percentage (%) for nominal variables. Significance of differences between groups with respect to the mean values was evaluated by Student's t-test. Nominal variables were assessed by Pearson's chi-Square test and Fisher's chi-Square test. Repeated VAS and ODQ values in groups were evaluated by Friedman's test. To identify the follow-up times, which cause a major difference when the Friedman's test results were significant, Bonferroni's modified Wilcoxon Sign test was used. Change in VAS and ODQ values before and after procedure or treatment were evaluated via Bonferroni's modified Mann-Whitney U-test. All results were accepted as statistically significant when p values were less than 0.05.

RESULTS

There were no statistically significant differences between the two groups in demographic features, social status, duration of complaint and trauma history ($p>0.05$), (Table I). For the patients in Group I posttreatment VAS scores on the 5th day and in the 1st, 3rd and 6th months were significantly lower than pretreatment scores ($p<0.001$). In the same way, postblockage VAS scores on the 1st day and in the 1st, 3rd and 6th months significantly decreased with respect to the preblockage values ($p<0.001$). The decrease in VAS scores in Group II was greater than those of Group I. The decrease in VAS scores in the posttreatment 1st, 3rd and 6th months of the patients in both groups was not statistically significant ($p>0.005$). In any case, the values of Group II were lower than those of Group I.

Similarly, posttreatment ODQ scores of the patients in Group I on the 5th day and in the 1st, 3rd and 6th months and postblockage ODQ scores on the 1st day and in the 1st, 3rd and 6th months of the patient in Group II were significantly lower than the pretreatment values ($p<0.001$) shown in Table II. The reduction of ODQ scores in Group II was greater than those in Group I ($p<0.005$).

DISCUSSION

LBP appears with different symptoms due to various factors affecting anatomical structures in the lumbar region. Some of these symptoms may cause limitation of daily activities and produce functional lumbar disability. The prevalence of LBP changes according to the age of the patients. Mayer et al claimed that the prevalence of LBP is higher between the ages of 40 and 60, but they found no correlation with its incidence (12). In this study patients of both groups accumulate between the ages of 30-40. Correlation of LBP with sex of the patients is not clearly demonstrated in the literature, although some studies have identified LBP with a slight female preponderance (4). In both groups of this study, the female/male ratio is approximately 2. This situation may be explained by the fact that most of the patients of this study are housewives.

There are some studies in the literature that reveal that LBP is related to height, weight or body mass index (BMI). The metabolic effect of obesity and the increase of loading with obesity have been put forward (2) as an explanation. The BMI of patients of both groups in this study is higher than the normal population.

Table I: Demographic and Social Status of the Patients

	Group I (n=40)	Group II (n=40)	P
Mean age ± SD	37.6±9.2	34.9±8.5	0.176
Sex			0.813
M	13 (32.5%)	14 (35.0%)	
F	27 (67.5%)	26 (65.0%)	
Height (m)	1.65±0.07	1.65±0.08	0.931
Weigh (kg)	72.1±12.2	73.6±15.0	0.611
BMI* (kg/m^2)	26.6±4.4	27.2±5.8	0.570
Education level			0.968
Elementary school	33 (82.5%)	29 (72.5%)	
High school	6 (15.0%)	9 (22.5%)	
University	1 (2.5%)	2 (5.0%)	
Occupational status			0.703
Housewife	23 (57.5%)	21 (52.5%)	
Employed	15 (37.5%)	18 (45.0%)	
Unemployed	2 (5.0%)	1 (2.5%)	
Pain history			0.215
0-1 Month	9 (22.5%)	4 (10.0%)	
1-2 Months	7 (17.5%)	5 (12.5%)	
2-3 Months	7 (17.5%)	5 (12.5%)	
>3 Months	17 (42.5%)	26 (65.0%)	
Minor trauma history**	21 (52.5%)	21 (52.5%)	-

***BMI:** Body mass index; ****Minor trauma:** Without neurological deficits and radiologically indemonstrable trauma*

Table II: VAS and ODQ Scores

	Group I (n=40)		Group II (n=40)	
	VAS	ODQ	VAS	ODQ
Pretreatment	7	21	8	23
Posttreatment				
Immediately after	3	9	2	5
1st Month	2	4	1	5
3rd Month	4	7	5	11
6th Month	5	11	2	3
P*	<0.001	<0.001	<0.001	<0.001

**Friedman test*

Cakmak et al demonstrated that LBP may be related to minor trauma (16). 52.5% of the patients in both groups of this study have a history of minor trauma.

LBP is ranked second among the diseases that cause sick leave from work and it has very high life-time prevalence (16,17). LBP can also cause disability and low self-esteem. Hence, medical therapies alone will not be sufficient to solve the social and economical aspect of this serious and widespread problem. When pain is eliminated, the patient can stay at work (6). The level of the decrease in pain and resolving time are other important factors in LBP treatment. A combination of medical therapy and bed rest is a proven method for treatment of LBP. This study revealed that the LBP of patients in both groups diminished after treatment. However, for patients in Group II, this diminishing was greater than for those in Group I. Besides, the blockage of lumbar facet joints (BLFJ) has an advantage as it does not require bed rest. The first favorable results for BLFJ were published by Lynch et al in 1986 (10). In their prospective study of BLFJ for LBP, Shih et al reported that pain was resolved in 53% of patients after three weeks, in 30% of patients after six weeks and in 17% of patients after twelve weeks (VAS<5), (20). Schulte at al declared that BLFJ was effective, reliable and easily applicable treatment for LBP in their study that used a distinctively designed questionnaire (18). The relevant literature (3,8,9,11,14) shows 22-100% of result as excellent for BLFJ with injection. That the results in the literature vary so widely may have several causes. Different methods of evaluation used in different studies may have caused different results. Studies of dissimilar patient populations can also cause this situation. Injection techniques and applied drugs and statistical analysis methods may have affected the results. Although there are many studies on BLFJ in the literature, these studies did not use standard methods for evaluation and injection techniques. As far as we know, there have been no randomized prospective study for compared medical and BLFJs, and there is no homogeneity for this topic in the literature. In this study, objective and standard scales for pain were used instead of the terms excellent, good, bad and so on. Besides, BLFJs were performed under a standard protocol. In addition, inter- and intragroup statistical analyses were carried out for a better understanding of the course of pain after treatment. Criteria for inclusion and exclusion in this study are also very strict. The most important two results of this study are that the decrease in pain level by VAS and ODQ for patients in Group II was greater and faster than for Group I and BLFJs did not require bed rest.

CONCLUSION

BLFJ is a rapid and effective way to reduce pain originating from lumbar facet joints. It makes it possible for the patient to stay at work, so does not cause financial loss. Consequently BLFJ is more cost-effective. Furthermore its application is easy. For these reasons BLFJ may be the treatment of choice for pain from facet joints.

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