Available online at www.medicinescience.org

ORIGINAL ARTICLE

Medicine Science International Medical Journal

Medicine Science 2022;11(3):1013-6

Comparison of two different treatment methods in the approach to facet (Zygapophyseal) joint pain

Atilla Kazanci[1], Dilek Kazanci[2]

[1]Ankara Yildirim Beyazit University, Faculty of Medicine, Department of Neurosurgery, Ankara, Turkey
[2]Health Sciences University, Department of Anesthesiology and Reanimation, Ankara City Hospital, Ankara, Turkey

Received 05 May 2022; Accepted 30 May 2022
Available online 19.06.2022 with doi: 10.5455/medscience.2022.04.104

Abstract

Low back pain has been recorded as the second most common pathology in adults. Irregularities in the zygapophyseal joints constitute one of the most well-known pathologies in this type of pain. Medial branch blocks and intra-articular injections have been used for the treatment. Local corticosteroid injections are also reliable for the treatment of low back pain. This study aims to compare the efficiency, in terms of low back pain palliation, of "intra-articular injection of local anesthetic and steroid drug combination" and "oral pain reliever and muscle relaxant combination" in the treatment of diagnosed non-discogenic low back pain. After Ethics Committee aproval 96 patients who had applied to outpatient clinic with low back pain complaints and were then treated for the diagnosis of facet joint pain between 2016 June -2019 June were examined. This retrospective study included 80 patients whose records were properly recorded and followed up in the scope of this one-center. Patients were classified into two groups; those given oral pain killers and muscle relaxants (n=40) and those who injected steroids and local anesthetics into the lumbar facet joint (n=40). Pain scores significantly decreased in both groups. When the low back pain is not discogenic, the patient should be subjected to further examination, and pain treatment should be started since this painful condition results in severe labor loss in society. We suggest that oral treatment or combined injections of steroids and local anesthetics for the cases, whose low back pain is determined to originate from the lumbar facet joint, will be very effective in therapeutic pain relief.

Keywords: Pain, facet joint injections, steroids, local anesthetics

Introduction

Lumbar Facet joints (LFJ) are located at posterior of the spinal column bilaterally. These joints, which are more accurately called zygapophyseal (Z) joints, are more commonly called facet joints in the literature. Because of wrong nomenclature, the joint is not between facet structure but it is between adjacent zygapophyseal joint processes and there is a articular cartilage that covers small joints. The Z joint and its degeneration is a cause of pain such as other synovial joints. One of the most common sources of low back pain (LBP) is the Z joint. There are many publications on the history and existence of Z-joint pain [1-3].

Musculoskeletal disorders are common in the population and LBP is one of the most common cause of this disorder and also LBP is a common cause of labor loss and pain in people younger than 45. A significant number of adults apply to a physician due to low back pain. Conservative methods can be used for more than 90% of the admitted patients with LBP for last than one month [4].

It has been reported that in 15-40% of patients with chronic LBP, the pain originates from the lumbosacral zygapophyseal (facet) joints. Many authors believe that Z-joint mediated pain is the main cause of mechanical LBP [1,4]. Diagnosing and treating Z-joint pain can help resolve low back pain in many patients. Medial branch of dorsal ramus (MBDR) innervates The Z joint. MBDR innervates many structures, including the Z joint. Muscles such as interspinales muscle multifidus muscle, intertransversarii mediales muscles, and some ligaments like as ligamentum flavum and the interspinous ligament are innervated by medial branch. The mamillo-accessory ligament (MAL) is held in place by a ligament connecting the transverse process and the superior articular process. This anatomical structure is an important indication for the relief or palliation of joint-mediated pain, whether by blocking with an

***Corresponding Author:** Dilek Kazanci, Health Sciences University, Department of Anesthesiology and Reanimation, Ankara City Hospital, Ankara, Turkey
E-mail: dilekkazanci@gmail.com

anesthetic agent (medial bundle branch block) or denervation with different techniques (e.g., medial branch radiofrequency ablation [RFA]) [5].

Laboratory tests are not usually needed to diagnose lumbosacral facet joint syndrome. Magnetic resonance imaging is not generally used for the evaluation of non-radicular LBP. The z-joint injection can also be used for diagnostic purposes. If at least 50% of patients' symptoms and pain decreases after joint injection, this is also diagnostic for facet joint pain. Exact number of blocks is uncertain before RFA treatment. There are some recommendations of some guidelines, such as the Spine Intervention Society (SIS) and the North American Spine Society (NASS) for the number of medial bundle branch block (MBBN). They recommend two successful medial branch nerve block attempt with at least 80% pain relief [6].

One of the treatment option is corticosteroids and local anesthetics intra-articular injection for LBP that is caused by facet joint hypertrophy [7]. One of the most accurate procedure for verifying LPB that is caused by Z-joint mediated pain is intra-articular anesthetic injections, mainly when performed at least a double block protocol. Technically the Z-joint injections are challenging due to joint degeneration and excessive bone growth.

In the light of this information, in this study, we aimed to analyze retrospectively and evaluate the pain management results of two different treatment groups who had low back pain that originates from the lumbar facet joint.

Materials and Methods

This study is an retrospective investigation of outpatient pain clinic treatment and follow-up records in patients who had low back pain due to zygaphophyseal (facet) joint disorder.

Various treatment options are offered to patients with subacute and chronic LBP who admitted to outpatient clinic. While injection therapy is generally recommended for all patients with this type of LBP, after the permission of Ankara City Hospital Ethics Committee permission, follow-ups of a total of 96 patients who accepted the injection or wanted to continue with medical treatment were analysed between the 2016 June-2019 June period Study criteria were designed as patıents who had local pain on the facet joint with have no symptom or neurologic examination sign as related to intervertebral disc pathology. We decided to include data of the patients whose treatment and follow-up results were accessible correctly recorded 40 patients who (Group I) were treated with oral analgesics and muscle relaxants , and the other 40 patients (Group II) were treated by injection into the LFJ with a mixture of steroids and local anesthetics. Patient evaluation after treatment is usually made with the Visual Analogue Scale (VAS) in our clinic [1]. The answers in routine treatment and follow up form including questions determining the pain and functional status of the patients before the procedure, after 1 week of treatment , and in the first and sixth months following the injection were clearly scanned.

Of the 96 patients who applied to our clinic with LBP and whose low back pain was determined to originate from the lumbar facet joint and were treated, 80 of them who met the study criteria were included and followed up retrospectively.

Inclusion criteria were determined as “pseudoradicular” low back pain, absence of neurological deficits, increased pain in the early day time, and pain caused by excessive exercise and stress. Of 96 patients, 16 patients were excluded. Exclusion criteria were irregular follow up, radicular pain or pain caused by systemic diseases such as rheumatic disease. Also coagulation disorders, local anesthesia intolerance, corticoid incompatibility, or pregnancy were exclusion criteria. All patients have lumbar biplane radiographs. Further examinations such as computerized tomography scans (CT) and magnetic resonance imaging (MRI) were applied to patients if necessary.

Eighty patients’ records were analyzed in a retrospective manner. Diclofenac sodium and thiocolchicoside were prescribed to patients in Group I, and some of the patients in this group did not accept intra-articular injection. Group II consists of patients who were applied prednisolone acetate (40mg) dissolved in 2ml of lidocaine to the lumbar facet joints under fluoroscopy or ultrasonography while the patient was in the semi-prone or prone position. Standard questionnaires were filled in for all patients during the control examinations in the first week and the first month after the treatment. In our clinic, pain measurement is done with VAS. In addition, analgesic use and functional status were also recorded. All of our patients have returned to their daily activities.

The distribution of the groups was calculated as n and % values. Numerical values are given as mean +/- standard deviation. The chi-square test was used to calculate the difference between the groups For numerical values according to groups, independent sample t test was used if the number of groups was 2, and ANOVA test was used if it was 3 or more. p value below 0.05 was considered statistically significant. (Reviewer 3 instruction, statistical method was explained at this part).

Results

Demographic data of both groups, social status, and additional morbidities are similar (Table 1). It was observed that the VAS scores of the patients in Group I were significantly lower in the first week and the first month after the treatment compared to the pre-treatment (Table 2). Similarly, in Group II, a significant decrease was recorded in the first month after injection compared to the first day the patient admitted to our polyclinic.. The patients were called by phone in the sixth month, and their pain status was determined (Table 2,3).

The VAS scores of Group I patients in the first week and the first and sixth months after the medication were significantly lower than before the treatment. Likewise, after facet joint injection at first week and at first and sixth-month VAS scores were significantly lower than before injection ($p<0.001$). Group II VAS scores decline was greater than that recorded in Group I. The decrease in VAS scores recorded in the first week and sixth months after the treatment was not significant between the two groups ($p>0.005$).

There was no significant difference between the two groups in terms of demographic characteristics, duration of pain, and trauma history ($p>0.05$) (Table 1). It was observed that the VAS scores in Group I patients in the first week and first and sixth months after the treatment were significantly lower than before the treatment ($p<0.001$) (Table 2). Similarly, post injection VAS scores recorded on the first week and at the first month and sixth months were

significantly lower than pre injection scores (p<0.001). The decrease in VAS scores of Group II patients was greater than that in Group I. However, the decrease in VAS scores recorded in both groups in the first week, and sixth months after treatment was not significant (p>0.005) (Table 1-3).

Only at the first month after treatment there is a significant difference between VAS scores of two groups. In any case, the values of Group II are lower than the values of Group I. However, it was observed that the effect of the injection decreased in the sixth month compared to the first month.

Table 1. Comparison of demographic data and VAS scores by groups

	Group 1	Group 2	p-value
Male	50(20)	52.5(21)	0.823
Female	50(20)	47.5(19)	
Age	48.5±12.7	48.78±12.6	0.944
BMI	26.6±3.1	26.9±3.0	0.746
Trauma history	1.9±0.9	2.2±1.1	0.686
VAS score 0	7.4±1.0	7.3±0.9	0.650
VAS score 1 week	3.2±1.1	2.8±0.8	0.053
VAS score 1 month	2.2±0.6	1.1±1.0	0.001*
VAS score 6 month	1.6±1.0	1.4±07	0.388

Body Mass Index: BMI
Visual Analog Scale: VAS
* Statistically significant between groups

Table 2. Group 1 Oral medication group; given oral painkillers and muscle relaxants

Group 1	Mean±SD	p-value
VAS 0	7.4± 1.0	0.0001¥
VAS 1 week	3.2± 1.1	
VAS 0	7.4±1.0	0.0001¥
VAS 1 month	2.2±0.6	
VAS 0	7.4±1.0	0.0001¥
VAS 6 month	1.6±1.0	
VAS 1 week	3.2±1.1	0.0001¥
VAS 1 month	2.2±0.6	
VAS 1 week	3.2±1.1	0.0001¥
VAS 6 month	1.6±0.6	
VAS 1 month	2.2±0.6	0.0001¥
VAS 6 month	1.6±1.0	

VAS: Visual Analog Scale
¥. Statistically significant in group

Table 3. Group 2 Injection group, Facet intra-articular injection group data

Group 2 injection	Ortalama	p-value
VAS 0	7.3±0.9	0.0001¥
VAS 1 week	2.8±0.8	
VAS 0	7.3±0.9	0.0001¥
VAS 1 month	1.1±1.0	
VAS 0	7.3±0.9	0.0001¥
VAS 6 month	1.4±0.7	
VAS 1 week	2.8±0.8	0.0001¥
VAS 1 month	1.1±1.0	
VAS 1 week	1.1±1.0	0.0001¥
VAS 6 month	1.4±0.7	

VAS: Visual Analog Scale
¥: Statistically significant in Group

Discussion

Low back pain (LBP) is the most common form of subacute and/or chronic spinal pain [1]. The prevalence of chronic Low back pain ranges from 15% to 45% [1,2,3,8].

Because of such a high incidence, different doctors from multiple specialties apply different treatments in various settings. To date, many treatment and intervention methods have been described for this disease, and the effectiveness of many of them has been demonstrated. Comparison of these accepted and proven methods is important to find the optimum treatment route. Proven treatment methods show the importance of interventional pain management alongside conservative treatments.

Among the various anatomical spine structures, the most common source of low back pain (LBP) is the Z joint. LBP caused by facet joint is more common in the elderly population. In the aging spine process degeneration followed by inflammation, and repetitive injury is the main causative mechanism of facet joint pain. In literature a review with six non-randomized studies provided clinical evidence. The benefit of facet joint injection was demonstrated in five of six publications reviewed in this article [8]. In our study, oral medical therapy and facet joint injection treatments were compared. Both treatments showed benefit compared to pretreatment. In our first month results, it was concluded that facet joint treatment was better than medical treatment.

Two randomized studies stand out regarding the clinical evidence of the therapeutic efficacy of facet joint injections. Carette et al reported the benefit of facet joint injection for the treatment of LBP caused by facet joint degeneration with a randomized, double-blind, placebo or active control trial [9]. In the study of Fuchs et al., a weak positive or indeterminate effect was found for multiple injections [10].

In the current study, both medical treatment and intra-articular injections in consenting patients effectively relieved pain. The physician who meets and examines the patient in the outpatient clinic makes the injection and arranges the medical treatment, which increases the success rate. In addition, the regulation of medical treatment will provide significant benefit to the patient in the acute period.

Conclusion

In this study, in which we evaluated the pain scores of our patients retrospectively, we determined that medical treatment or injection therapy gave significant results in terms of pain palliation in this evaluation performed in the period of acute pain. At the first month after treatment, it was concluded that facet joint injection was better than medical treatment.

However, further follow-up and additional treatment modalities may produce more successful and promising results. More studies are needed to modify medical treatment and facet joint injections in this patient group and perform them effectively and on time.

Conflict of interests
The authors declare that there is no conflict of interest in the study.

Financial Disclosure
The authors declare that they have received no financial support for the study.

Ethical approval

Ankara City Hospital Ethics Committee permission, follow-ups of a total of 96 patients who accepted the injection or wanted to continue with medical treatment were analysed between the 2016 June-2019. (E2-22-1748).

References

1. Saravanakumar K, Harvey A. Lumbar zygapophyseal (facet) joint pain. Rev Pain. 2008;2:8-13.
2. Manchikanti L, Singh V, Falco FJ, et al. Lumbar facet joint nerve blocks in managing chronic facet joint pain: one-year follow-up of a randomized, double-blind controlled trial: Clinical Trial NCT00355914. Pain Physician. 2008;11:121-32.
3. Lakemeier S, Lind M, Schultz W, et al. A comparison of intraarticular lumbar facet joint steroid injections and lumbar facet joint radiofrequency denervation in the treatment of low back pain: a randomized, controlled, double-blind trial. Anesth Analg. 2013;117:228-35.
4. Bartleson JD. Low Back Pain. Curr Treat Options Neurol. 2001;3:159-68.
5. Shih C, Lin GY, Yueh KC, Lin JJ. Lumbar zygapophyseal joint injections in patients with chronic lower back pain. J Chin Med Assoc. 2005;68:59-64.
6. Juch JNS, Maas ET, Ostelo RWJG, et al. Effect of radiofrequency denervation on pain intensity among patients with chronic low back pain: the mint randomized clinical trials. JAMA. 2017;318:68-81.
7. Do KH, Ahn SH, Cho YW, Chang MC. Comparison of intra-articular lumbar facet joint pulsed radiofrequency and intra-articular lumbar facet joint corticosteroid injection for management of lumbar facet joint pain: A randomized controlled trial. Med (Baltimore). 2017;96:e6524.
8. Nelson AM, Nagpal G. Interventional approaches to low back pain. Clin Spine Surg. 2018;31:188-96.
9. Carette S, Marcoux S, Truchon R, et al. A controlled trial of corticosteroid injections into facet joints for chronic low back pain. N Engl J Med. 1991;325:1002-7.
10. Fuchs S, Erbe T, Fischer HL, Tibesku CO. Intraarticular hyaluronic acid versus glucocorticoid injections for nonradicular pain in the lumbar spine. J Vasc Interv Radiol. 2005;16:1493-8.