Original Article

Evaluation of outcome of facet joints injections in low back pain

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ABSTRACT

Objective: To find out outcome of short- and medium-term therapeutic efficacy of facet joint blocks.

Methodology: This descriptive interventional study was conducted in the Department of orthopaedic Khyber Teaching Hospital Peshawar, over a period of nine months January, 2008 to September, 2008. All patients were more than 20 years and less than 70 years with low back pain who were not responding to oral medications and Physiotherapy were included in the study. The facet joint blocks were performed under fluoroscopic guidance. The initial pain response was assessed prospectively using Mac nab and Prolo pain assessment criteria. Additional data, including short-term effect (> 1 week) and medium-term effect (at 3 months), were collected by a structured review interview. A note was made of the results of various imaging studies done in these patients. Just for exclusion & inclusion purposes and not for assessment of outcome which was exclusively based on clinical assessment.

Results: A positive effect was seen in 37 patients (74%) and 28 (56%) patients in immediate (with in one week) and short term (after 6 weeks) period respectively, while lesser effect was found in 16 patients (33%) at medium term (after 3 months).

Conclusion: Facet joint blocks appear to have a beneficial medium-term effect in one third of patients with chronic lower back pain and may therefore be a reasonable adjunct to non-operative treatment. However, outcome appears to depend on clinical, not the morphologic, imaging findings.

KEY WORDS: Fluoroscopy, interventional radiology, low back pain, spine.

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INTRODUCTION

Every year, 3-4% of the population is temporarily disabled, and 1% of the working-age population is disabled totally and permanently because of LBPR. LBP is second only to the common cold as a cause of lost work time; it is the fifth most frequent cause for hospitalization and the third most common reason to undergo a surgical procedure. Back pain is one of humanity's most frequent complaints. In the U.S., acute low back pain (also called lumbago) is the fifth most common reason for physician visits. About nine out of ten adults experience back pain at some point in their life, and five out of ten working adults have back pain every year.[1]

Productivity losses from chronic LBP approach $28 billion annually in the United States. The most common area affected is low back; this is because the lower back supports most of body weight. Low back pain is the number two reason that Americans see their doctor-second only to colds and flus.[2-4]

Traumatic or degenerative conditions of the spine are the most common causes of chronic LBP. A number of anatomic structures of the lumbar spine have been considered as the origin of lower back pain.[5-9] The significance of the lumbar facet in this context has been debated since the beginning of the last century.[10] Several authors have investigated pain patterns by injecting lumbar facet joints with hypertonic saline or by surgical stimulation.[5-9,11] Several studies have shown that the diagnosis of facet syndrome may be based on pain relief after intra-articular facet joint injection[12] or on provocation of pain by hypertonic saline injection followed by pain relief after injection of anesthetics.[13]

Efficacy of facet joint block in facet syndrome has not been evaluated as extensively as its diagnostic performance. No outcome differences between intra-articular and peri-articular injection of local anesthetics and methyl prednisolone or saline injection were found in many studies.[14,15] Nelemans & deBie et al conclude that there is no convincing evidence for the therapeutic efficacy of facet joint blocks in patients with lower back pain.[16]

At our set up, facet joint blocks are routinely used to support nonoperative treatment for chronic lower back pain presumably due to symptomatic facet joint osteoarthritis. Our anecdotal perception is that a considerable proportion of patients report substantial pain relief after this procedure. However, there is paucity of studies exploring the prediction of the therapeutic efficacy of a facet joint block. Selecting patients with chronic lower back pain who would benefit from a facet joint block would save health care costs.

The objective of this study was to investigate outcome of the short- and medium-term therapeutic efficacy of facet joint blocks.

METHODOLOGY

Settings: This Experimental, interventional and prospective study was conducted in Department of Orthopedic Khyber teaching hospital Peshawar, over a period of nine months. (Jan, 2008—Sep, 2008) A total of fifty patients were enrolled in this study through convenience sampling.

Inclusion criteria: All patients more than 20 years and less than 70 years of age with low back pain not responding to oral medications, short wave diathermy and Physiotherapy were included

Exclusion Criteria: Patients with low back pain due to Fracture vertebrae and Pressure on nerve roots in spinal canal. Patients operated in the past for PID etc, and had spinal deformities and osteoporosis were also excluded.

Data Collection Procedure: All patients with chronic low back pain fulfilling inclusion criteria were examined and investigated after taking detailed history at orthopedics Out Patients Department. Khyber teaching hospital Peshawar, confounding factors were controlled by excluding patients with fracture vertebrae and pressure on nerve roots by any means in spinal canal based on what criteria. Imaging Based

Pre-Injection Management: Detailed patient history regarding demographic status, duration of low back pain, medications used, were recorded. The severity of backache assessed by using two pain assessing scales i.e. Prolo and Macnab criteria.

All patients who underwent a lumbar facet joint block, the diagnosis of facet syndrome was based on the clinical presentation, lower back pain with or without radiation into the buttocks, thigh, or groin; increased pain on hyperextension; morning stiffness; and pain when starting to move after relatively prolonged sitting. Exclusion criteria were the presence of radicular leg pain; a neurologic deficit; spinal surgery before the facet joint block; neoplasm; infection; and insufficient knowledge of the language predominantly spoken at the investigating institution. A total of 50 consecutive patients who met these criteria were included in our investigation. Facet joint block was performed bilaterally at two levels.

The target facet joints and sides were selected on the basis of clinical presentation and the presence of facet joint osteoarthritis. The culprit facet joint was picked up through deep clinical palpation. Informed consent was obtained from all patients who participated in the study.

Injection Technique: The technique we used is a modification of the one described by Bogduk et al.[17] All injections were administered in our orthopaedic operation theatre. The facet joint blocks were performed under fluoroscopic guidance with the patient lying prone. To visualize the lumbar joints, either the patient was rotated appropriately and supported in an oblique prone position or the image intensifier and tube were tilted accordingly.

After appropriate disinfection, the skin over the target joint was anesthetized with 2-3 ml of inj.

Table-I: Prevalence of Low Back Pain In Different Socio-Economic Groups.

Socio-economic status	*No. of Patients*	*Percentage*
Poor (monthly income about, 5,000 Rs.)	30	60%
Average (monthly income about, 10,000-15,000 Rs.)	15	30%
Rich (monthly income >15,000 Rs.)	5	10%
Total	50	100%

xylocaine 2%. A 22-gauge spinal needle was then inserted parallel to the X-rays beam, aiming at the joint space. In heavy patients, a coaxial needle technique was used, in which a 22-gauge needle was passed through a shorter 18-gauge needle. Depending on the specific situation (anatomic factors, presence or absence of osteophytes), either the midpoint or rather the cranial or caudal part of the joint was targeted. Subsequently, a mixture of 0.5-1.0 ml of local anesthetics (bupivacaine 0.5%) and 1ml of steroids (40 mg) of depomedral (methyl prednisolone) was injected. The patients were kept under surveillance for at least 15 minutes after termination of the facet joint block.

Variables and Data Management: The patients were routinely followed up in the orthopaedics outpatient clinic (O.P.D), 6 weeks and 12 weeks. The initial (15-30 min) pain response was prospectively collected using a visual analogue scale. For immediate-term response analysis, we asked patients to score the degree of pain reduction in relation to the pain level before the facet joint block.

Besides the patient's age, sex, and marital status, the following general health indicators were recoded: general life satisfaction, general health, and whether the patient smokes. In addition, patients were asked about other clinical variables including the first episode and the number of episodes of lower back pain, maximum pain level, influence of different provocative movements, and pain alleviation by motion, and joint-blocking sensation ("lumbar catch"). The following outcome variables were considered: pain reduction 15-30 minutes after injection (immediate effect); pain reduction for more than one week (6 week usually short-term effect); and pain reduction for more than three months (medium-term effect). Responders were defined as those who reported a reduction in pain of more than 50%.

Data Analysis Procedure: Data was entered in software SPSS version10.0. Descriptive statistics were used to calculate mean and standard deviation of age, gender, profession, and socio-economic status, severity of low back pain and effectiveness of injection therapy. Frequency and percentages were calculated for all categorical data.

RESULTS

Fifty patients with low back pain between ages 20-70 years were studied. Out of 50 patients 37(74%) were females and 13(26%) were males. Thirty (60%) patients belonged to poor families, 15 (30%) to average while 5 (10%) to rich families.

The mean follow-up period was three months (range). Only one patient suffered from paresthesia for 5-6 hours post injection in rest of the patients no other complications were seen. Thirty-seven patients (74%) experienced immediate pain reduction of more than 50%, nine of whom (19%) had complete disappearance of pain.

After one week, 28 patients (57%) were still experiencing a pain reduction of more than 50%. The nine initially pain-free patients remained asymptomatic after one week.

After three months (medium-term effect), pain relief of more than 50% persisted in 16 patients (33%). Thirteen patients (26%) experienced no immediate, short-term, or medium-term pain relief. After seven days, three subjects who initially experienced no decrease in pain at all reported pain relief of between 20% and 45% that lasted up to 30 days. Final over view of outcome of facet joint injection in low back pain is given in Table-II.

In 28 cases, all injections were intra-articular, and in four cases only a periarticular injection was possible. In the remaining patients, a mixed intraarticular-periarticular injection of the selected joint was performed. There was no significant relationship between socio-demographic factors and positive response to a facet joint block.

Table-II: Final overview of outcome (pain relief) of facet joint injection in low back pain.

S. No.	*TIME of review Since Facet Joint Injection*	*Back Pain relieved*	
		No. of patients	*%*
1.	At one week	37/50	74%
2.	At 6 weeks	28/50	56%
3.	At 12 weeks (3 months)	16/50	33%

DISCUSSION

Nelemans et al[16] concluded that there is no convincing evidence for the therapeutic efficacy of facet joint block in the treatment of lower back pain. Similarly, Bogduck reported the lack of efficacy of intra-articular facet joint injections in a review article.[17] Our results differ from Bogduk, who has stated that the apparent efficacy of lumbar intra-articular steroids is no greater than that of a sham injection and that there is no justification for the continued use of this intervention because better outcomes can be achieved with placebo therapy.[18] Some lumbar facet pain is of a neuropathic origin.[19] One should therefore expect facet joint pain reduction with medial branch nerve blocks, and the effectiveness of these injections has been substantiated by investigators in this patient population.[20-21]

However, based on our anecdotal experience, a substantial number of patients benefit from facet joint block in the medium term. In our study group, 33% of patients responded well (>50% pain relief) after three months. These results are in line with previously published investigations about the therapeutic effect of facet joint blocks.[16,22] Admittedly, the precise mechanism of such effect is not known. Lilius et al.[23-25] found comparable effects after placebo (saline) and methyl prednisolone injections. In addition, even the relatively small injection volumes used at our institution are probably too large to remain completely contained within the small facet joints. In previously published investigations, larger volumes have been used than that used in our standard protocol. The expected leakage of infiltrated substances may lead to confounding effects, such as blocking of the nerve roots or their branches. However, independent of the underlying mechanisms, facet joint blocks result in considerable pain relief (> 50% pain reduction for more than three months in 33% of patients) in patients with chronic lower back pain and can be applied without any adverse effects.

Outcome predictors after facet joint block are important to limit the facet joint blocks to a population with a positive medium-term therapeutic effect??. Interestingly, facet joint degeneration was not a predictor. No statistically significant difference in the medium-term effect between low- and high-grade facet joint osteoarthritis could be found in our investigation. However, patients with pain alleviation on motion and higher grades of osteoarthritis were more likely to respond immediately, indicating a correlation to symptomatic facet joint osteoarthritis. If only patients with pain decreasing with motion and without joint-blocking sensation were injected, immediate and medium-term success (>50% pain decrease) would have been achieved in 75% and 100% of patients, respectively. Only four patients in our study group fulfilled both criteria, and this combined evaluation of symptoms was not statistically significant.

This study and previously published investigations have attempted to relate several clinical signs to the outcome of facet joint block. Jackson[26] and Jackson et al.[27] concluded that there were no such findings predicting injection response. Revel et al.[28] reported several predictor variables (i.e., age> 65 years, pain not exacerbated by coughing, not worsened by hyperextension, not worsened by forward flexion, not worsened when rising from flexion, not worsened by extension-rotation, and well relieved by recumbency) for a positive effect to lidocaine facet joint blocks. Our study design does not point out these variables as confounding!

Possible Limitations of this study: The retrospective pain assessment may decrease the reproducibility and validity of our results. Moreover, there was no control group receiving a placebo treatment. However, the presence and extent of the placebo effect have to be taken into account when discussing the efficacy of facet joint blocks.[28] In addition, it is unlikely that the natural history of lower back pain would positively influence the course in our patient group. In patients with chronic lower back pain[29] natural history is unlikely to have a positive influence anymore plus all these patients were not getting better with any treatment and have confessed some benefit from the therapeutic measure. There is a certain group of patients who do not seem to benefit from any treatment.

CONCLUSIONS

From this study we see a beneficial medium-term effect (> 3 months) in one third of patients (33%) with chronic lower back pain and facet joint blocks may therefore be a reasonable adjunct to non operative treatment. However, further exploration of the therapeutic efficacy—particularly with regard to cost-effectiveness—is required to determine more conclusively the value of facet joint blocks in patients with lower back pain.

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