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Research Article

Epidural Steroid Injection: Efficacy in Low Back Pain with Radiculopathy

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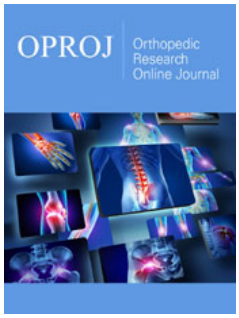

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Abstract

Introduction: Low back pain is a common musculoskeletal disorder affecting 80% of people at some point in their lives with incidence of lower limb radiation more than 40%. Male suffer more than female with ratio of 2.6:1. The socioeconomic impact of Low Back Pain (LBP) is massive. LBP is the most common cause of disability in younger age group i.e. age below 45 years. With conservative measures, the symptoms show significant improvement within a few weeks from onset. LBP is the second most frequent reason to visit a physician for a chronic condition, the fifth most common cause for the hospitalization, and the third most frequent reason for a surgical procedure.

Objective: The objective was to determine the short-term efficacy of epidural steroid injection in the treatment of low back pain with radiculopathy.

Patient and method: A descriptive case series comprising of 181 patients was done at Hayatabad medical complex Peshawar from February 2018 to March 2019. Patients were selected through non probability sampling who wanted conservative management of low back pain with epidural steroid injection after taking informed consent. The procedure was done by same surgeon in same environment of Operation theater under aseptic measures.

Result: A total of 181 patients were studied, out of which 120 (66.3%) were male and 61 (33.7%) were female. Age ranged from 20-60 years with mean age of 43.51±8.13 years. Epidural steroid injection was effective in 56.9 % (n=103) patients, with at least one grade improvement in their symptoms, and in 43.0% (n=78) patients was not effective.

Conclusion: Epidural steroid injection is a simple, cost-effective and minimally invasive treatment for sciatica (radicular pain). The complications are negligible and temporary and the procedure is highly useful in patients who desire quick relief. But it is not useful in long-term pain relief or obviates the need for surgery.

Keywords: Chronic low back pain; Anterior longitudinal ligament; Radicular pain; Epidural steroid injection

Introduction

Low back pain is the most common of all chronic pain disorders [1]. Low back pain (LBP) is defined as chronic after 3 months because most of the connective tissues heal normally within 6-12 weeks unless there is any patho-anatomic instability.

Chronic LBP may persist due to slower rate of tissue repair in the relatively avascular intervertebral disk. An estimated 15-20% developed protracted pain, and approximately 2-8% have chronic pain. Of those individuals who suffered from LBP for more than 6 months, fewer than half return to work, and after 2 years of LBP. Disability, a return to work is even more unlikely [2]. Recent studies suggest that one third to one fourth of patients in a primary care setting may still have problems after 1 year [3,4].

Life time incidence of low back pain is 50-70% with incidence of lower limb radiation more than 40%. Male suffer more than female with ratio of 2.6:1 [5]. The socioeconomic impact of chronic low back pain (cLBP) is massive. cLBP is the most common cause of disability in younger age group i.e. age below 45 years [6,7].

Each year 3-4% of the US population is temporarily disabled, and 1% of the working-age population is totally and permanently disabled [3,8]. LBP is the second most frequent reason to visit a physician for a chronic condition [3,8,9], the fifth most common cause for the hospitalization, and the third most frequent reason for a surgical procedure [3,10,11].

Chronic low back pain is a multi-factorial disorder with many causes i.e. inter-vertebral disc, facet joints, ligaments, fascia, muscles & nerve root Dura as tissues capable of transmitting pain in the low back. Radicular pain is produced by irritation of the Dural covering of the nerve root by protrusion of the disc and causes pain that radiated to the buttock, posterior thigh, and calf and may be associated with paraesthesia, numbness in the corresponding dermatomes, weakness, and depressed reflexes in the muscles supplied by that nerve root [12].

Most commonly, diagnoses of acute painful spinal conditions are nonspecific, such as neck or back strain of muscles and ligaments, although injuries may affect any of several pain-sensitive structures, which include the disk, facet joints, spinal musculature, and ligamentous support [13,14]. Inflammatory arthropathy, metabolic bone conditions, and fibromyalgia are cited in others as the cause of chronic spine-related pain conditions [13,14].

There are multiple causes of low back pain i.e. mechanical and non-mechanical (neurological). Mechanical lumbar syndromes are typically aggravated by static loading of the spine (e.g. prolonged sitting or standing), by long lever activities (e.g. vacuuming or working with the arms elevated and away from the body), or by bending forward postures [15].

Pain is reduced when the spine is balanced by multidirectional forces (e.g. walking or constantly changing positions) or when the spine is unloaded. Mechanical conditions of the spine, including disc disease, spondylosis, spinal stenosis, and fractures, account for up to 98% of LBP cases, with the remaining ones due to systemic, visceral, or inflammatory disorders [16]. Sciatica is the pain that is localized in the distribution of one or more lumbo-sacral nerve roots, typically L4-S2, with or without neurological deficit [13,14].

There are different modalities of treating low back pain i.e. conservative and surgical. Conservative treatment involves; Bed rest, physical therapy; osteopathic/chiropractic manipulation [4], massage therapy, non-steroidal or steroidal anti-inflammatory drugs, and epidural steroid injection [17]. The majority of radiculopathy patients respond well to this conservative treatment, and symptoms often improve within six weeks to three months.

The commonly performed procedures for low back pain relief worldwide areepidural steroid injections, efficient for radicular pain than mechanical spine pain [18,19]. If patients do not improve with the treatments listed above they may benefit from an epidural steroid injection. This can help to rapidly reduce the inflammation and irritation of the nerve and help reduce the symptoms of radiculopathy. It is reported that sciatica could be treated by epidural injection [20]. The use of epidural corticosteroid injections for the treatment of axial and radicular back pain was first reported in 1953 [21]. The efficacy of epidural steroid injection in different studies are 65% [8], 64%-81% [9] and 71% [22].

If the symptoms continue despite all of the above treatment options and the symptoms persist, then surgery may be an option [23]. This study was undertaken to know the efficacy of epidural steroid injection as a conservative treatment modality in treatment of low back pain with radicular symptoms.

Patient and Method

A descriptive case series comprising of 181 patients was done at Hayatabad medical complex Peshawar from February 2016 to March 2017. Patients were selected through non probability sampling who wanted conservative management of low back pain(Pain below the L_1 vertebra to the S_1 vertebral region and radiating to buttock, thigh and calf in the distribution of nerve root and categorized on Oswestry low back pain scale (detected by history and clinical examination) with a minimum duration of 4 weeks) with epidural steroid injection after taking informed consent from the patients. After inclusion in the study, a detailed history was taken followed by detailed physical and systemic examination; two injections of Methylprednisolone 80mg diluted with 10ml of Lidocaine 2% were injected into epidural space with duration of two weeks interval under c arm fluoroscopy.

After injection the patients were kept for 30 minutes under observation in the procedure room for hemodynamic stability and then the patient was discharged. Patients were re-assessed at 01 month follow up to determine efficacy in terms of improvement in at least one grade of pain on Oswestry low back pain Scale (No pain (0-20%), Mild (20%-40%) grade 1, Moderate (40%-60%) grade 2, Severe (60%-80%) grade 3 and Very Severe (80%-100%) grade 4).

All the above-mentioned information including name, age, gender, address was recorded in a pre-designed proforma. Exclusion criteria were strictly followed to control confounding variables and bias in the study results.

Inclusion criteria

a) All patients with low back pain with radiculopathy.

b) Moderate (40%-60%) to Severe (60%-80%) and very severe (80%-100%) pain.

c) Age 20 to 60.

d) Either gender.

Exclusion criteria

a) History of previous spine surgery

b) History of previous spine fracture

c) Past medical hip joint illness

d) Malignancy

e) Infection

f) Epidural spinal steroid injection within last 6 months.

Data was analyzed by SPSS version 21.0. Descriptive statistics used to describe, summarize, and organize data. Mean±standard deviation was calculated for numerical variables like age and duration of pain. Frequency and percentage were calculated for categorical variables like gender and efficacy. Efficacy was stratified among age, gender and duration of pain to see the effect modifications. Results were presented in the form of tables and graphs.

Result

Among 181 patients 66.3 % (n=120) were male and 33.7 %(n=61) were female. Age ranges from 20 to 60 years with mean age of 43.51±8.31 years. Epidural steroid injection was effective in 56.9%(n=103) patients, with at least one grade improvement in their symptoms, and non-effective in 43.0% (n=78) patients.

At presentation 56.4% (n=102) were Grade 2 (moderate severity) patients, Grade 3 (severe) were 39.2% (n=71), and Grade 4 (very severe) were 4.4% (n=08). Epidural steroid injection was effective in 56.9 %(n= 103) patients, out of these 90.29% (n=93) had their symptoms for less than 40 months and only 9.7% (n=10) patients had symptoms for more than 40 months. Epidural steroid injection was ineffective in patients 43.0% (n=78). Out of these 42.8% (n=33) had their symptoms for less than 40 months and 57.14% (n=44) patients had symptoms for more than 40months.

Gender of patients

Figure 1

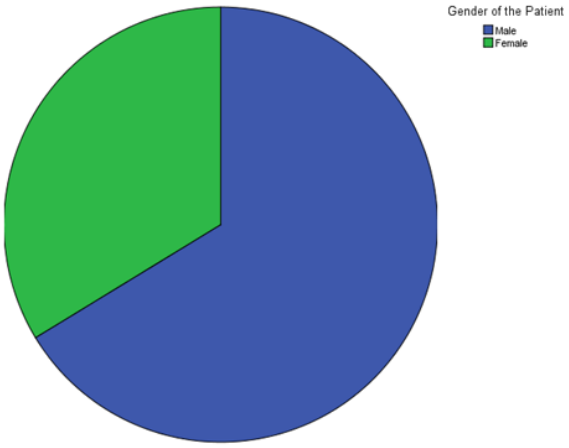

Figure 1

Grades of pain at presentation

Table 1

Table 1

Grades of Pain	Frequency	Percentage (%)
Moderate (Grade 2)	102	56.4
Severe (Grade 3)	71	39.2
Very Severe (Grade 4)	8	4.4
Total	181	100

Efficacy in male versus female

Figure 2

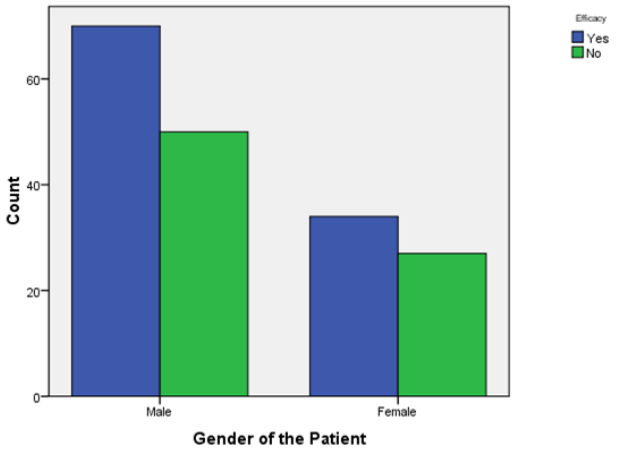

Figure 2

Discussion

Low back pain is the most common of all chronic pain disorders1. Low back pain with or without lower extremity pain is a medical condition affecting the spine in young adults. Life time incidence of low back pain is 50-70% with incidence of lower limb radiation more than 40%. Majority recovers with conservative treatment, however in some patients low back pain with radiculopathy, conservative pharmacologic and/or physical therapy may not provide adequate pain relief. Therefore, more aggressive therapies such as epidural steroid injection may be helpful in such patients [20,24]. An Epidural Steroid injection can decrease inflammation in the epidural space and can decrease pain in the affected nerve root.

In our study, out of 181 patients included, 66.3% (n=120) were males and 33.7% (n=61) were females with a male to female ratio of 2:1, which is consistent with all the series cited that male predominantly affected than females [5,25]. The reason may be that men are more exposed to heavy labored work i.e. twisting, heavy lifting, and repetitive bending. Moreover, because of the social values here in our province Khyber Pakhthunkhwa the males report to the hospitals more than the females. The mean age of patients was 43.5 years with minimum of 25 and maximum of 60 years, which is also showed consistency with other cited studies that low back pain is most commonly seen in 4th and 5th decades of life and rare before 20 years [2].

The strength of my study is that the efficacy of epidural steroid injection was 57.2%, moreover this effective modality of treatment

is the first ever conducted study in present setup. This study at least generated some local statistics about the different modalities in the treatment of low back pain and the results of this study will be now used as a first hand evidence to make necessary modifications in our local guidelines for the treatment of low back pain with radiculopathy. My study collaborates with all the mentioned series of studies except for only one study of Kovacs FM et al, in which the efficacy is 71% [22]. The duration of symptoms that is low back pain with radiculopathy at presentation in my study was minimum of 8 months and maximum of 72 months with mean of 28.10.

Efficacy of epidural steroid injection in my study patients with duration of symptoms below 40 months were 93 out of 103 (90.29%) patients and non-effective in 33 out of 77 (42.8%). According to my inclusion criteria, Grade 2 to 4 of Oswestery low back pain scale were included, so at presentation Grade 2 (moderate severity) patients were 56.4% (n=102), Grade 3 (severe) 39.2% (n=71), and Grade 4 (very severe) were 4.4% (n=8), out of 181 with a mean of 1.48.

The efficacy of Epidural steroid injection in patients with Grade 2 were 71 (69.60%) and non-effective in 31(30.39) out of 102 patients, in Grade 3 were 30 (42.25%), and non-effective in 41 (57.74%) out of 71 patients, the efficacy in Grade 4 was 3 (37.5%), and non-effective in 5 (62.5%) out of 8 patients. This is probably because of, greater the mechanical compression over the nerve root the greater will be the damage to the nerve and the more will be the symptoms, and the lesser will be the efficacy.

In my study epidural steroid injection was found more effective in male than female, that is in out of 104 effective patients 70 (67.3%) were male and 34(32.6%) were females. This probably because female is more fatty our setup here in Khyber pakhtunkhuwa than males and this might be reason in my study that the correct placement of epidural needle is easier in male than in females to achieve the desired results. This study is implicated on urologist, Gyneacologists and other health professionals who come across the low back pain.

Conclusion

The role of epidural steroid injections in the conservative management of radicular pain is simply to facilitate earlier pain relief and return to full function. The usefulness of epidural steroids for the treatment of acute radicular pain have failed to show that injection reduces long-term pain or obviates the need for surgery, but Epidural steroid injection is a simple, cost-effective and minimally invasive treatment for sciatica (radicular pain).

The complications are negligible and temporary and are highly useful in patients who desire quick relief. It also serves as a 'water-shed' procedure and a prognosticator. Patients with poor response will most likely require surgical solutions as these indicate severe mechanical compression beyond local inflammation, swelling, oedema and adhesions.

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