Original Article

Orthopedic

Outcome of Caudal Epidural Steroid Injection in Chronic Low Back Pain

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ABSTRACT

Introduction: Caudal epidural injection can be considered in persistent low back or sciatic pain not responding to conservative measures. There has been dramatic increase in the use of epidural steroid injection. They are now one of the most commonly performed procedures in the United States for the management of low back pain.
Study Design: Experimental study
Place and Duration of Study: The study was conducted at Liaquat university Hospital and a private practice setup during the period from may 2009 to December 2011.
Materials and Methods: Numeric rating scale (NRS) was used to document the intensity of pain. (0 no pain, 1-3 mild pain, 4-6 moderate pain, and 7-10 sever pain.) Inclusion criteria were adult patients between the ages of 18 to 60 years. History of moderate to severe lower back for a minimum period of 8 weeks. Exclusion criteria History of trauma, tuberculosis, and tumor related to the spine. Previous history of spine surgery. Uncontrolled medical illness, pregnancy. Sensitivity to injection drugs. A mixture of 9 ml of 1 % lidocaine and 1ml (40 mg) of methyl prednisolone was taken in a 10 cc syringe. Anatomical landmarks were palpated and a 20 gage spinal needle was passed in sacral hiatus without fluoroscopic control. Hoosh test was performed and the mixture was injected. The injection was repeated a total of three times in non responders. Second injection was given after 48 to 72 hours and third after 2 weeks of second injection. The results were assessed soon after first injection, after two week, six weeks, three months and six months. Pain relief was taken as significant when 50% or more of reduction was seen in NRS.
Results: A total of 50 patients were included in the study. Mean NRS at base line was 6.8. Thirty two out of 50 patients show significant pain relief (50% or more reduction in NRS from base line) after single injection and were pain free at 6 months.
Eighteen out of 50 patients show no relief soon after injection. The procedure was repeated in these patients and a total of three injections were given. Among these patients only 8 responded with significant pain relief which was sustained for 6 months. The remaining 10 (20%) patients did not responded and had no pain relief after third injection. These patients were referred to specialized centers. Mean NRS in 50 patients soon after injection was 3.86, after two weeks it was 3.56, after 6 weeks 2.64. Ten non responding patients were referred to specialized centers at this stage and in the remaining 40 (80%) patients became totally pain free at 3 and 6 months after injection.
Conclusion: caudal epidural steroid injection is effective in patients with chronic low back pain. In majority of patients good long term pain relief is achieved. The procedure is easy to perform and has low complication rate. Failure rate may be high if the injection is performed without fluoroscopic control.
Key Words: caudal steroid, back pain.

INTRODUCTION

The lifetime prevalence of low back pain has been reported as 54%–80% and annual prevalence range is from 15% to 45%. Beside this there is enormous economic health and social impact.[1]

Caudal epidural injection can be considered in persistent low back or sciatic pain not responding to conservative measures.

The contraindications of the procedure are sensitivity to local anesthetic, sepsis at the injection site, patients on anticoagulant therapy, and previous neurological injection.

The rare but possible adverse effects are infection, accidental spinal anesthesia, with or without spinal headache in patients with unusually low dura, subperiosteal injection which is painful but not dangerous.[2]

There has been dramatic increase in the use of epidural steroid injection.[3,4]

They are now one of the most commonly performed procedures in the United States for the management of low back pain.[5]

The caudal entry in epidural space is relatively easy and has minimum risk of Dural puncture. The disadvantage of the procedure is the necessity of injection of large volume of fluid and unrecognized placement of the needle outside the epidural space[6,7,8].

The reported volume of injection is between 10 ml to 64 ml for caudal injection. It is said that to reach L5 level, 10 ml and to reach L4 segment 15 ml of fluid is required[9,10].

Complications like increased intraocular pressure and retinal hemorrhage have been reported with high volumes of injection in epidural space[11,12].

The efficacy of caudal steroid in the treatment of low back pain has been demonstrated but the mechanism of action has not been clearly understood. The explanation usually given is that corticosteroid exerts anti-inflammatory action by inhibiting synthesis or release of inflammatory substances[13,14].

Other reasons could be membrane stabilization, inhibition of neural peptide synthesis or action of phospholipase A2 activity and suppression of neuronal discharge. [15]

In this study we have assessed the efficacy of caudal epidural steroid injection containing a mixture of of 9 ml of 1 % lidocaine and 1ml (40 mg) of methylprednisolone, in patients with chronic low back pain and sciatica.

The objective of the study was to evaluate the effectiveness of caudal epidural injection of mixture of local anesthetic and steroid for the management of chronic low back pain not responding to other conservative measures.

MATERIALS AND METHODS

The study was conducted at Liaquat university Hospital and a private practice setup during the period from may 2009 to December 2011.

At the time of registration, patient's history was recorded, medical and surgical history taken radiological investigation was done. Physical examination was performed.

Numeric rating scale (NRS) was used to document the intensity of pain. (0 no pain, 1-3 mild pain, 4-6 moderate pain, and 7-10 sever pain.)

Inclusion criteria were adult patients between the ages of 18 to 60 years, history of moderate to severe lower back for a minimum period of 8 weeks, and ability to understand the procedure and provide voluntary informed consent.

Exclusion criteria were history of trauma, tuberculosis, and tumor related to the spine, previous history of spine surgery, uncontrolled medical illness, pregnancy and sensitivity to injection drugs.

Patient was placed prone on operating table with pillow under symphysis pubis and buttocks exposed. A mixture of 9 ml of 1 % lidocaine and 1ml (40 mg) of methylprednisolone was taken in a 10 cc syringe. The area was isolated and painted with povidone iodine. Patient's buttocks were separated by an assistant. Two Cornua of sacral hiatus were palpated by starting distally and moving finger up the dorsal surface of coccyx until a slight step is felt. Hiatus usually lies at the point of a downward pointing equilateral triangle whose other two angles are two posterior inferior iliac spines. The area was infiltrated with local anesthetic. A 20 gage spinal needle with sty let was inserted between cornua on either side, the arch of S5 above and coccyx below, the angle is roughly parallel to the body of S5 and usually horizontal or slightly inclined downwards.

The sty let was withdrawn to see if CSF or blood comes out. In rare patients the dura extends lower than usual. In this case the CSF comes out and the procedure in abandoned. In case the blood comes out the needle is repositioned to avoid and intravascular injection.

When there was no leaking of CSF, Hoosh test (injection of air into the caudal epidural space with simultaneous auscultation over the thoracolumber spine) was performed. Then the syringe containing a mixture of 9 ml of 1% lidocaine and 1 ml (40mg) of methylprednisolone was attached to the spinal needle and was slowly injected. During injection the hand was placed on the lower sacrum to feel the swelling of skin indicating superficial injection. The needle was removed after injection and sterile gauze swab was placed in the natal cleft. Patient was advised to wait for few minutes before getting up and walking. The injection was repeated after 48 to 72 hours in those patients in which pain was not decreased. The injection was repeated a total of three times in non responders. Second injection was given after 48 to 72 hours and third after 2 weeks of second injection.

The results were assessed soon after first injection, after two week, six weeks, three months and six months. Pain relief was taken as significant when 50% or more of reduction was seen in NRS.

Primary outcome measures were significant pain relief for 6 months, and secondary outcome measure was no pain relief or less than 20% improvement in NRS at 3 weeks and after three injections.[2]

Short term relief was defined as less than 6 weeks and long term as relief more than 6 weeks.

RESULTS

A total of 50 patients were included in the study. The age range was between 18 to 60 years (mean 39.6years). Thirty two patients were male (64%) and 18 were female (36%). Among 32 male patients, 14 worked as labor, 6 office workers, and 12 farmers. Among 18 female patients 6 worked in farms and 12 were house wives. Numeric rating scale (NRS) was used to document the intensity of pain. (0 no pain, 1-3 mild pain, 4-6 moderate pain, and 7-10 sever pain.) . The intensity of pain at the time of intervention was moderate to severe in all patients. Mean NRS at base line was 6.8.

Thirty two out of 50 patients show significant pain relief (50% or more reduction in NRS from base line) after single injection and were pain free at 6 months.

Eighteen out of 50 patients show no relief soon after injection. The procedure was repeated in these patients and a total of three injections were given. Second injection was given after 48 to 72 hours and third 2 weeks after second injection. Among these patients

only 8 responded with significant pain relief which was sustained for 6 months. The remaining 10 (20%) patients did not responded and had no pain relief after third injection. These patients were referred to specialized centers.

Mean NRS in 50 patients soon after injection was 3.86, after two weeks it was 3.56, after 6 weeks 2.64. Ten non responding patients were referred to specialized centers at this stage and in the remaining 40 (80%) patients became totally pain free at 3 and 6 months after injection. Technical difficulty was encountered in passing needle in 5 patents. Transient hypotension was detected in 10 patients during the procedure. The procedure was stopped and vital signs were monitored. Second attempt was made and successfully completed. Eight out of 50 patients reported transient bilateral lower extremity numbness after the injection. No bladder or bowel dysfunction was noticed.

DISCUSSION

Our study has some limitations. Caudal epidural injections were performed without image intensifier. We used "Hoosh" test and proper palpation of land marks to confirm proper needle placement. Stitz and Sommer report successful placement of needle in 92% of cases, by proper recognition of palpable landmarks[16,17].

Non availability of fluoroscopic guidance may result into difficulty of entering the epidural space via the sacral hiatus, traumatic experience for the patient, and more chances of missing the sacral canal. [18]

A control group using local anesthetic only could have improved this article. We also decided against placebo-control group because the patients were having pain for more than 8 weeks and withholding proper treatment was ethically not advisable.

Most of our patients belong to profession involving lifting of heavy loads. This shows that occupation is a major risk factor in patients with chronic low back pain. Occupations like farming and heavy weight lifting by laborers are major contributory factor to the chronic low back pain. The 18(36%) non responders after first injections in our series were given two more injections. Among these 8 responded to the treatment with long term relief.

Multiple caudal injections have been used by many authors to control the symptoms.

Waldman, used 7.5 ml of 1% lidocaine and 80 mg of methylprednisolone with the first block and 40 mg of methylprednisolone with subsequent blocks, it was repeated in 48- to 72-hour intervals. The patients were checked again at 6weeks, 3 months, and 6 months.

Visual Analog Scale and Verbal Analog Scores for all pts were reduced 63% at 6 wks, 67% at 3 months, and 71% at 6 months. The patients had Positive short-term and long-term relief.[19]

Bush and Hillier included 23 pts with lumbar nerve root compromise in their study and randomized into 2 groups. The Experimental group received 25 ml: 80 mg triamcinolone acetonide + 0.5% Procaine hydrochloride (n=12) and Control group received 25 ml normal saline (n=11). Two caudal injections, were given, the first after admission to the trial and a second after 2 wks. Follow up check was made at 4 wks and at1 year. They reported Positive short-term and negative long-term relief.[20]

Matthews et al in their Randomized, double-blind trial, used 20 ml bupivacaine 0.125% + 2 ml (80 mg) methylprednisolone acetate (n=23) in experimental group and 2 ml lignocaine (over the sacral hiatus or into a tender spot) (n=34)in control group. The injection was repeated up to 3 times as needed. The patients were checked at 2 weeks, 1, 3, 6 and 12 months.

After 3 months, patients in experimental group reported significantly more pain-free than in control group. Negative short-term and positive long-term relief was reported.[21]

Our results show both short term and long term relief from symptoms in 80% of patients. The failure rate in our series was 20%. The procedure was not performed under fluoroscopic control in our series this explains the relatively high failure rate.

Hypotension was a major complication of the procedure in our series.

CONCLUSION

Caudal epidural steroid injection is effective in patients with chronic low back pain. In majority of patients good long term pain relief is achieved. The procedure is easy to perform and has low complication rate. Failure rate may be high if the injection is performed without fluoroscopic control.

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