Variation In The Method Of Caudal Epidural Injection- A Regional Survey
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Citation

Abstract
Background and purpose of the study: Despite being commonly used as one of the treatment modality of chronic back pain there is no clear guideline regarding technique, drug doses, frequency and timing of treatments and efficacy rate being quoted to patient for this procedure. The aim of our study was to highlight the variation in carrying out caudal epidural injection procedure. This we hope may underline the need for a consensus in technique and medication being used for management of LBP by caudal epidural injections. Method: We conducted a regional survey in south east of England. A questionnaire was sent to 30 consultants who perform caudal epidural injection (CEI) for back pain radiating to leg (Sciatica). Results: We got the response from 22 consultants (Response rate 73 %) There was considerable variation in the use of X-ray/Fluoroscopy, use of anesthetic agent and steroid and efficacy rate quoted to the patients. Conclusion: Despite the longevity of the practice of Caudal Epidural injections (CEI) for the management of back pain radiating to leg, there remain a number of unresolved issues. Our study reflects the variation in the actual procedure being undertaken and the medications used throughout the region, which may in turn have an impact on the clinical outcome. This highlights the need for guideline for caudal epidural injection.

INTRODUCTION
Low back pain is an important medical, social, and economic problem involving approximately 15% to 39% of the population. Of the numerous therapeutic interventions available for treatment of chronic low back pain, including surgery, epidural administration of corticosteroids is one such intervention commonly used. (1)

The caudal approach to the epidural space was first reported in 1901. Injection of steroids to treat low back pain was introduced in 1952. (1)

Conservative management of low back pain radiating to leg includes the use of caudal epidural steroid injections, which have become increasingly more popular in the last 20 years. The objective of an epidural steroid injection is to deliver corticosteroid close to the site of pathology, presumably onto an inflamed nerve root. (1) The body of literature regarding the efficacy of these injections is vast, conflicting, and difficult to summarize. (2)

The effectiveness of injection therapy for low-back pain is still debatable (3) Heterogeneity of target tissue, pharmacological agent and dosage or Surgical technique including using X-ray/fluoroscopy may be one of the reasons for the varied response.

The aim of our study is highlight the variation in surgical technique, medications used and the prognosis quoted to the patient. This may in turn help us to come out with certain recommendations for spinal epidural injections in future.

MATERIAL AND METHOD
A questionnaire was designed with seven questions relating to the procedure of Caudal Epidural Injections (CEI) for pain relief. This was sent to 30 consultants from south east of England who performs caudal epidural injections for pain relief in Feb 2009. These included 15 anesthetic consultants, 6 neuro-surgery consultants and 9 orthopedics consultants with special interest in spine.

RESULTS
We received 22/30 completed questionnaire representing response rate of 73%. The answers to the questions were as follows:
Figure 1
1. Do you use imaging for caudal epidural injections?

Figure 2
2. Do you carry out caudal epidural injection under anesthesia?

Figure 3
3. Which local anesthetic agent do you use for caudal epidural injection?

Figure 4
4. Which corticosteroid do you use?

Figure 5
5. Total Volume injected in caudal epidural injection

Figure 6
6. What do you make the volume with?

Figure 7

DISCUSSION

Even though the prevalence of low back pain (with or without radicular pain) is high and the morbidity accompanying it is substantial (4) its etiology remains controversial (5). There is increasing evidence that an intervertebral disc can contribute to low back pain through various processes (degeneration, herniation, inflammatory reaction) (6).

Sicard introduced, in 1901 the injection of cocaine through sacral hiatus into the epidural space, in order to treat patients suffering from severe intractable sciatic pain or lumbago (7). Ever since, Caudal epidural injections are commonly used when dealing with chronic low back and/or radicular pain (7) in order to address potential pathology adjacent to the epidural space.
The caudal approach to the epidural space is the earliest known technique for epidural steroid injection (8). This approach however, did not gain universal recognition until 1925, when Viner popularized its use for the treatment of sciatica (8). Evans was the first to report good results in patients undergoing caudal epidural injections containing only saline; he attributed them to the physical displacement of neuronal elements and to the stretching and lyses of the neuronal adhesions caused by injectate.

Caudal epidural injections (CEI) with steroids are an effective modality of treatment in managing chronic, persistent low back pain that fails to respond to conservative modalities of treatments. (9) They are only indicated for leg dominant pain i.e. sciatica and root irritation. Epidurals give a short period of improvement and are ineffective in the long term. They may be associated with severe adverse effects. (10)

Despite the longevity of the practice of Caudal Epidural injections (CEI) for the management of back pain, there remain a number of unresolved issues. We have tried to highlight few of these with special reference to actual surgical procedure.

Our first question was regarding use of x-ray/fluroscopy. Fluoroscopic guidance has been frequently cited as a requirement for caudal epidural steroid injection. (11). Barham et al reported 32% of non-radiologically guided caudal epidurals fail to deliver the therapeutic agents to the site of pathology (12). Ergin et al suggested real time imaging in addition to routine fluoroscopy for caudal epidural procedures (13) as it may improve efficacy and safety by assuring accurate drug deposition. In our study one in four consultants do not use routine fluoroscopy for caudal epidural steroid injection.

Our second question was related to the use of anesthesia for this procedure. There is one study done on cattle by De Rossi et al (14) in which they have compared the systemic effect of dorso-lumber epidural anesthesia using lignocaine and bupivacaine. They concluded that in standing cattle the dorsolumbar epidural injection of lignocaine provided faster onset of anesthesia and fewer cardiovascular effects, but had a shorter duration of anesthesia than bupivacaine. In our study we found out that most of the consultants use some form of anesthesia and most commonly used agent is lignocaine. 6 out of 22 do not use any local anesthetic agent and one of the consultants uses general anesthesia for this procedure.

Most popular steroid agent for caudal epidural steroid injection in our study was depomedrone (66%) and the other agent used was triamcinolone (33%).

Manchikanti et al (15) suggest caudal epidural injections with local anesthetic with or without steroids are effective in patients with chronic low back pain of discogenic origin without facet joint pain, disc herniation, and/or radiculitis. In our study all but one consultant use steroid for caudal epidural injection.

Total volume of drug administered varies as well. Few consultants do not dilute the anesthetic and steroid but majority of them uses normal saline as the dilutant. Most of them inject between 8 to 20 mls of medication.

Finally the efficacy rate coated to the patient varies widely between 30-70% with majority quoting between 50-60%.

Irrespective to these numerical values our study clearly highlights the variation found across different consultants in giving caudal epidural injection.

**CONCLUSION**

Despite the reasonable response to this questionnaire survey, the answers reflect wide variations in the technique and medications used for caudal epidural injections. This may lead to inappropriate response to the treatment, and inadequate or insufficient pain relief. Our study highlights the need for thorough guideline for lumber epidural injection for pain management.

**APPENDIX 1**

**QUESTIONNAIRE**

1. Do you use imaging for this procedure?
   - Yes
   - No

2. Do you carry out the procedure under anesthesia?
   - (a) G/A
   - (b) Sedation
   - (c) Local
   - (d) None

3. Which agent do you use as local anesthetic and what dosage?
   - (a) Lignocaine
   - (b) Chiorecaine
   - (c) Bupivacaine (Marcaine)
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(d) Others

4. Which corticosteroid do you use and what dosage?
   (a) Depomedrone
   (b) Triamcicline
   (c) Other/None

5. Please state the total volume you inject?

6. What do you make up this volume with?
   (a) Normal Saline
   (b) Water for injection

7. What percentage efficacy do you quote to patients?

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