Available online at www.sciencedirect.com
ScienceDirect
The Surgeon, Journal of the Royal Colleges of Surgeons of Edinburgh and Ireland
www.thesurgeon.net

Effect of epidural methylprednisolone on post-operative pain and length of hospital stay in patients undergoing lumbar microdiscectomy

Yasser Aljabi [a,b,*], Amr El-Shawarby [a], Derek T. Cawley [b], Thomas Aherne [c]

[a] Department of Neurosurgery, Tawam Hospital in affiliation with Johns Hopkins Medical, Al-Ain, United Arab Emirates
[b] Department of Orthopaedics, Beaumont Hospital, Dublin, Ireland
[c] Department of Surgery, Beaumont Hospital, Dublin, Ireland

ARTICLE INFO

Article history:
Received 8 August 2013
Received in revised form
27 March 2014
Accepted 29 March 2014
Available online 7 June 2014

Keywords:
Epidural
Methylprednisolone
Lumbar
Discectomy

ABSTRACT

Background & aim: Intraoperative epidural corticosteroids have been used to decrease post-operative pain post-discectomy. The objective of this study is to assess the efficacy of epidural corticosteroids on post-operative pain and length of post-operative hospital stay in patients undergoing unilateral lumbar microdiscectomy.

Methods: 150 consecutively treated, comparable patients with unilateral lumbar disc herniation were prospectively allocated randomly to receive either a sponge soaked in epidural corticosteroids or saline at the end of the operative procedure. The intensity of spontaneous pain was quantified by using the Oswestry low back pain index pre-operatively, at discharge, at week 1 follow-up and at 1st month of follow up. At the same intervals, each patient underwent the passive straight leg-raising test (PSLRT) and Visual Analogue Scale (VAS) testing. The duration of hospital stay, time taken to return to daily life activities and quantity of analgesia consumed post-operatively were also recorded.

Results: The mean hospital stay was 1.3 ± 0.9 days in the corticosteroids group (group 1) compared to 3.2 ± 1.2 in the control group (group 2). The mean interval until return to daily life activities was 6.7 ± 2.1 days in group 1 versus 9.6 ± 4.1 days in group 2. No statistically significant difference was measured between the steroid-treated and control groups when the data were stratified for sex, age, and site of disc herniation. Differences in the OLBI scores were statistically significant at all post-operative intervals. At baseline (preoperatively), group 1 (DepoMedrol™ group) had an average score of 72.3% (±2.6%) compared to 74.6% (±3.1%) in group 2 (Control group) ($P = 0.45$). At discharge, OLBI scores declined to 49.7% (±4.5%) in group 1 compared to 63.5% (±3.9%) in group 2 ($P = 0.034$). At week 1 follow-up, OLBI scores further declined to 41.3% (±2.9%) in group 1 versus 54.2% (±5.3%) in group 2 ($P = 0.014$). After one month of follow-up, OLBI scores were 34.1% (±6.7%) in group 1 and 42.6% (±4.1%) in group 2 ($P = 0.004$). Results of VAS and PSLRT are also documented in the manuscript. The mean postoperative analgesic medications consumed was 15.6 ± 1.9 mg of morphine equivalent in the corticosteroid group versus 10.3 ± 1.8 mg of morphine equivalent in the control group. No complications of treatment occurred in either groups.

* *Corresponding author*. Department of Orthopaedics; Beaumont Hospital, Beaumont Road, Dublin 9, Ireland.
E-mail addresses: Yasseraljabi@rcsi.ie, yasseraljabi@gmail.com (Y. Aljabi).
http://dx.doi.org/10.1016/j.surge.2014.03.012

Conclusion: Intraoperative application of epidural corticosteroids, Depomedrol, significantly reduces post-operative pain, length of post-operative stay and duration to return to daily living activities following lumbar discectomy.

Introduction

Treatment for Nucleus Pulposus herniation is discectomy if conservative treatment fails. Discectomy significantly alleviates back pain as well as radicular symptoms post-operatively.[1] Yet, in a large proportion of patients who undergo discectomy, residual back discomfort and radicular leg pain are not uncommon.[2] This pain may vary in intensity, from mild to severe, and can cause significant postoperative disability, prolonged hospital stay, and occupational as well as social implications.

Reduction of inflammation and oedema of the affected nerve root should, theoretically, reduce the postoperative pain intensity. Many surgeons routinely use local corticosteroids during lumbar discectomy to reduce traumatic nerve root inflammation and oedema; however, such practice seems to be controversial. A number of studies have assessed the advantages, and others, the disadvantages, of this practice in terms of reduction of post-operative pain and improving functional outcome; however, most of these studies have been inclusive or based on small study samples.[3–16]

The following report presents a prospective, randomized case-control study of local application of DepoMedrol™ (methylprednisolone) on the affected nerve root perioperatively. We compared the outcome of the use of intra-operative corticosteroids with a control group that received a local application of saline intra-operatively. We assume that local application of low-dose steroid alone is sufficient to reduce the postoperative morbidity without increasing side effects or complications.

In the present study, the primary end point was level of pain in the post-operative period following local application of epidural steroid in lumbar microdisectomies in the perioperative period. Secondary end points were hospital stay and duration to return to daily living activities. This study was conducted in Tawam Hospital – Al Ain, United Arab Emirates, in affiliation with Johns Hopkins Medical – USA.

Methods

From June 2010, to September 2012, 162 patients with unilateral herniated lumbar disc were evaluated for our study. 150 patients were included in the study, 7 were excluded due to preoperative infection and 5 were excluded as they had spinal stenosis rather than true lumbar disc herniation. In the control group (39 males and 36 females, median age 42 years, 18–60) 44 L3/L4 and 31 L4/L5 were performed; and in the intervention were group; 35 males and 40 females, median age 45 years, 21–53) 51 L3/L4 and 24 L4/L5 microdiscectomies. Patients excluded if they were pregnant, osteoporotic or known keloid formers, or had a preoperative infection, compromised immune system, or an autoimmune disease. Patients younger than the age of 18 and older than 75 years were also excluded from our study. Power analysis was performed and 130 patients were required to achieve statistical significance.

Patients were prospectively allocated randomly to receive either in-situ absorbable collagen sponge soaked in 80 mg Methylprednisolone Acetate (DepoMedrol™) or collagen sponge soaked in saline at the end of the operative procedure. Randomization was performed by opening an envelope towards the end of the operative procedure. All envelopes were kept with one of our hospital's senior pharmacists. The patient demographics were similar in the 2 groups with respect to age, sex, levels treated, and preoperative back and leg pain intensity. Blinding was not possible as both Surgeons (AES and YAJ) were involved in the study.

A single primary spinal Neurosurgeon (AES) operated on all patients in the same manner. Once anaesthetized, patients were placed in the prone position with flexion of the knee joint to 15–20°. No local anaesthesia was administered prior to surgery. Incision was performed over the identified segment determined with the aid of an image intensifier television (IITV). The paraspinal muscles were subsequently stripped on the side of herniation with flavotomy and medial nerve root retraction revealing the herniated disc. Following haemostasis, a collagen-sponge soaked with 80 mg methylprednisolone acetate (DepoMedrol™, Upjohn, Puurs, Belgium) was incorporated into the closure encapsulating the nerve-root. Saline soaked Gelfoam was applied in the control group. Closure was performed with a mini-drain left in situ for 24–48 h post operatively.

Peri-operative care in both groups was carried out according to an established proforma. Pre-operatively, prophylactic cephalosporin was administered and general anaesthesia was standardized with Propofol, Remifentanil, Rocuronium, and Glycopyrronium. Immediate post-operative analgesia consisted of Fentanyl 100 μg and Tramadol 30 mg.

Daily analgesia consisted of acetaminophen 1 g 6 hourly and Celecoxib 200 mg, Oxycontin (20 mg BD), oxynorm (5 mg PRN) and intravenous morphine (50–100 μg/kg) were used as analgesic adjuncts.

The preoperative and postoperative morbidity of these two groups were evaluated by completing the Oswestry Low Back