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Original article

Immediate postoperative pain level from lumbar arthrodesis following epidural infiltration of morphine sulfate☆

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ABSTRACT

Objective: To evaluate the pain level in patients treated with epidural infusion of morphine sulfate in a single dose, after a surgical procedure to perform lumber arthrodesis.
Methods: Forty patients underwent posterolateral lumbar arthrodesis or intersomatic lumbar arthrodesis via a posterior route at one, two or three levels. They were prospectively randomized into two groups of 20. In the first group (study group), 2 mg of morphine sulfate diluted in 10 mL of physiological serum was infiltrated into the epidural space, through the laminectomy area. The second group (controls) did not receive analgesia. The patients were asked about their pain levels before and after the operation, using a visual analog scale (VAS).
Results: It was found that the patients presented a significant diminution of pain as shown by the VAS. From before to after the operation, it decreased by an average of 4.7 points ($p = 0.0001$), which corresponded to 53.2% ($p = 0.0001$).
Conclusion: Application of 2 mg of morphine sulfate in a single epidural dose was shown to be a good technique for pain therapy following lumbar spinal surgery.

Nível de dor no pós-operatório imediato de artrodese lombar após infiltração epidural com sulfato de morfina

Palavras-chave:
Morfina
Analgesia epidural
Dor pós-operatória

RESUMO

Objetivo: avaliar o nível de dor em pacientes tratados com infusão epidural de sulfato de morfina em Dose única, após procedimento cirúrgico de artrodese lombar.
Métodos: Foram submetidos à artrodese lombar posterolateral ou artrodese lombar intersomática por via posterior, em um, dois ou três níveis, 40 pacientes, divididos, prospectivos

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Artrodese
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e randomizados em dois grupos de 20. No primeiro grupo (de estudo) foram infiltrados no espaço epidural, através da área da laminectomia, 2 mg de sulfato de morfina diluídos em 10 mL de soro fisiológico. O segundo grupo (controle) não recebeu analgesia. Os pacientes foram interrogados quanto ao nível de dor, no pré e pós-operatório, com o uso da escala visual analógica (EVA).

Resultados: Verificou-se que os pacientes apresentaram uma queda significativa da dor pela EVA. A dor entre o pré e o pós-operatório diminuiu em média 4,7 pontos (p = 0,0001), o que corresponde a 53,2% (p = 0,0001).

Conclusão: Aplicação de 2 mg de sulfato de morfina, em dose única epidural, demonstrou ser uma boa técnica na terapia da dor após cirurgia na coluna lombar.

Introduction

Despite advances in the treatments for postoperative pain, a large number of patients still suffer after spinal surgery. Most of these surgical procedures cause intense pain during the immediate postoperative period, and this may last for at least three days.[1–5] This pain may increase morbidity and the incidence of complications, along with delaying rehabilitation. Furthermore, postoperative pain is a risk factor, given that it may give rise to development of chronic pain syndromes.[6]

Safe and efficient methods for postoperative analgesia are therefore essential following vertebral arthrodesis procedures. Parenterally administered opioids are most frequently indicated for analgesia among patients who have undergone lumbar arthrodesis by means of a posterior route.[7] Epidural analgesia has been used in some procedures in the lumbar spine, such as vertebral arthrodesis, laminectomy, discectomy, hemilaminectomy and foraminectomy.[8–10] However, administration of opioids intravenously or intramuscularly is generally done at doses that may cause side effects, such as respiratory depression, nausea, vomiting, sedation, urine retention, pruritus and paralytic ileus.[7] Other possible causes of pain may include the patient's positioning over the perioperative period; prolonged anesthesia; long posterior surgical incisions, which give rise to discomfort in the postoperative position of dorsal decubitus; large detachment of the paravertebral musculature, which is necessary for surgical access; and long periods of use of surgical retractors.[7] Since the dural sac is dissected during this procedure, morphine can easily and safely be injected into the epidural region, by the surgeon during the procedure.[8,10–16]

This randomized prospective study had the objectives of comparing patients who underwent posterior arthrodesis of the lumbar spine with untreated patients and ascertaining the efficacy of a single dose of epidural morphine sulfate during the immediate postoperative period.

Methods

Between June 2008 and January 2010, 40 patients who underwent intersomatic lumbar arthrodesis via a posterior route in one, two or three levels were evaluated. These patients, who had diagnoses of degenerative disk disease or stenosis of the lumbar spinal canal, were operated under general anesthesia at Hospital Santa Teresa, Petrópolis. Approval for this study was obtained from the institution's ethics committee and informed consent was obtained from all the patients. Patients were excluded if they presented the following criteria: ASA > III, allergy or intolerance to morphine, pregnancy, previous opioid use, preoperative pain other than in the lumbar spine or previous lumbar spine surgery. After the surgical procedure, patients in Group 1 (study group) underwent in situ epidural infiltration through the laminectomy area, consisting of 2 mg of morphine sulfate diluted in 10 mL of 0.9% physiological serum. Group 2 (controls) did not undergo infiltration. Both groups were evaluated regarding pain levels 24 h before the surgical procedure and 18–24 h after the surgery, by means of a visual analog scale (VAS). This scale formed an instrument for measuring the evolution of the pain levels (Table 1).

Statistical methodology

The data observed were analyzed descriptively and presented in the form of a table showing frequencies (n) and percentages (%) for the categorical data and the mean ± standard deviation and medians for the numerical data.

The statistical analysis was composed of the following methods:

- To ascertain whether there were any significant differences in the numerical variables between the two groups (study and control), Student's t test for independent samples or the Mann–Whitney test was used for nonparametric variables, and the Chi-square test (χ^2) was used for comparing categorical data (qualitative variables).
- To analyze the change in the pain scale from before to after the operation, the Wilcoxon signed rank test was used (nonparametric variables).

Nonparametric methods were used because some variables (pain scale and deltas) did not present normal distribution (Gaussian distribution), because of the dispersion of the data and rejection of the hypothesis of normality according to the Kolmogorov–Smirnov test. The criterion adopted for determining significance was the 5% level. The statistical analysis was processed by means of the SAS® System