

Quasi-Experimental Study: Intrathecal Analgesia Clonidine vs. Morphine for Immediate Postoperative Pain Management in Column Surgeries

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Abstract

Introduction: Immediate postoperative pain management is essential for the patient's greater comfort and early rehabilitation. The goal of this study is to evaluate the immediate analgesic postoperative effect in posterior lumbosacral spine surgery, as well as the adverse effects of the administration of intrathecal analgesia, using Clonidine versus Morphine.

Material and methods: An analytical, quasi-experimental, prospective, longitudinal, comparative, double-blinded intervention study was conducted to compare the efficacy of immediate postoperative intrathecal analgesia in primary posterior lumbosacral spine surgery and the adverse effects. The patients were divided into two previously designated groups. One group received Clonidine 0.5 micrograms/kg and the other group received Morphine 5 micrograms/kg. Intrathecal, intraoperative.

Results: There was a statistically significant difference between better postoperative pain management in the first hours and less vomiting in the group of patients who received intrathecal Clonidine. There was no statistically significant difference between both intrathecal medications in the evaluation of other adverse effects.

Discussion: The use of intrathecal analgesia, has been on the rise over time and more studies have been conducted to see the efficacy of different drugs, different doses, with fewer adverse effects. This study analyzes these variables with a view to finding a better therapeutic option. The advantage is having a representative if a not random sample, strict follow-up, and appropriate statistical analysis.

Conclusion: Intrathecal Clonidine proved to be more effective in immediate postoperative pain management after posterior lumbosacral spine surgery and with fewer adverse effects.

Keywords: Postoperative Analgesia; Lumbosacral Spine Surgery; Clonidine; Morphine

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Citation: Edward R, Aldo V, Marcelo M (2022) Quasi-Experimental Study: Intrathecal Analgesia Clonidine vs. Morphine for Immediate Postoperative Pain Management in Column Surgeries. Prensa Med Argent, Volume 108:6. 380. DOI: <https://doi.org/10.47275/0032-745X-380>

Received: December 05, 2022; **Accepted:** December 21, 2022; **Published:** December 26, 2022

Introduction

For every surgeon it is important to handle immediate postoperative pain for better patient comfort and earlier rehabilitation, also considering that patients with spinal pathology already come with previous neuropathic pain that has an impact on their quality of life. A strategy used is the administration of intrathecal analgesia. The first reports begin in 1979 when Behar M, et al. (1979) [1], reported the use of epidural and intrathecal opioids for acute post-operative pain management. Different doses of intrathecal clonidine [2].

Intrathecal morphine produces a marked and selective inhibition of small fibers A, Delta, and C, which are involved in pain conducting, dose of 0.1-0.2 mg is reported Intratuals provide a greater balance of pain with decreased adverse effects [3]. Because of its hydrophilicity that increases rostral migration in CSF, possibly leading to respiratory depression. Intrathecal clonidine is a selective Alfa 2 agonist that enhances postoperative analgesia by hyperpolarizing fibers A and C in the gelatinous substance of the spinal cord. The low doses of clonidine

have good analgesic efficacy with a low incidence of adverse effects [4].

The work aims to examine and compare the effects of morphine against intrathecal clonidine, observing the effectiveness in the management of immediate post-operative pain of lumbosacral column surgery by later, such as the presence of lower adverse effects, through A quasi-experimental intervention study.

Material and Methods

An analytical study of intervention, quasi-experimental, prospective, longitudinal, comparative, and double-blind was carried out. In a University Hospital of the City of Buenos Aires, Argentina, where the Lumbar Column Surges were included later, held on June 1, 2017, to the thirty -first of May 2018, under the approval of teaching and research of the Institution (Resolution No. 00984/94) and the informed consent of patients.

The independent variable is the administration of intrathecal analgesia, intra-operation grouped in group 1 clonidine 0.5



micrograms/kg/weight, group 2 morphine 5 micrograms/kg/weight, which studied the post-operative in the internment room of orthopedics and traumatology, as variables Dependent post-operative pain valued through the Analogous pain % of blood oxygen, in addition, the presence of vomiting, pruritus and rescue analgesia needs such as dichotomous variables (si-no) was valued, the patient's diagnosis was also valued by grouping in 5 groups, group 1 narrow lumbar conduit, Group 2 Lumbar instability, group 3 spondylolisthesis, group 4 deformities, group 5 lumbar hernia or 2 arthrodesis less than 3 levels, group 3 arthrodesis more than 3 levels and the Owes try questionnaire to assess the degree of previous disability.

All lumbar column surgeries were considered by subsequent route, carried out during a calendar year, it was divided into two groups, the first surgeries were made from June 2017 to November 2017 where clonidine should be administered as intrathecal analgesia, second December group of December 2017 to May 2018 where morphine would be administered as intrathecal analgesia. Patients older than 18 years were included, in which intrathecal analgesia (morbid obesity, sleep apnea) is not contraindicated, and patients who have to perform review surgery (re-intervention), rejection of the Informed consent, scoliosis surgeries, tumor, infection, fractures and as discontinuation criteria patients who attend the post-operative in closed unity of intensive care, medical history with less than 85% of the information.

The data collection was overturned to an Excel spreadsheet 2013 version for storage and was analyzed by the IBM SPSS statistical program, 2019 version.

All patients completed the Owes try questionnaire in the pre-surgical and the analysis of the analogous pain scale was explained and the signing of the consent was obtained. The patient did not know the intrathecal medication that was going to be administered, intraoperatively. The intrathecal analgesia was administered once the instrumentation is finished, prior to the closure of the surgical wound

and all the patients who passed to the Orthopedics and Traumatology International Room The same 1000 ml of 1000 ml analgesia plan of physiological solution with 100 mg From Tramadol to 14 drops per min EV, Pregabalin 75 mg every 8 hrs. VO, Paracetamol 500 mg every 8 hrs. VO, they are administered metoclopramide 10 mg every 8 hours EV, as an antiemetic and in case of needing analgesia rescue unit was Ketorolac 30 mg in Bolo EV. They were monitored by the traumatology residents who did not know the intrathecal medication received, and records of the variables at 4 hrs, 8 hrs, 16 hrs, 24 hrs, and 48hrs post-surgical were taken.

To carry out the study, a sample of 48 patients was collected using a 50% probability, 5% error margin, and 95% confidence. The chi-square test for qualitative variables plus Lambda proof to see the degree of relationship and the 1 Kruskal-Wallis factor test plus Friedman test to assess non-parametric data as appropriate. A $p < 0.05$ was considered statistically significant.

Results

From June 1, 2017, to May 31, 117 column surgeries were performed, of which only 48 patients complied with the inclusion criteria, 23 patients belonging to group 1 that are administered intrathecal clonidine, and 25 patients to group 2 that are administered intrathecal morphine.

In the valuation of pain prior to surgery, it was seen that patients diagnosed with hernias had significant statistical value ($p = 0.013$) compared to other pathologies, but did not differ statistically, the diagnosis in relation to their quality of life-based on the measurement of the Owes try ($p = 0.205$). Nor was a statistically significant value regarding the assessment of the type of surgery performed in

Relationship to post-operative pain ($p = 0.258$) and post-operative pain in relation to diagnosis ($p = 0.195$), figure 1:

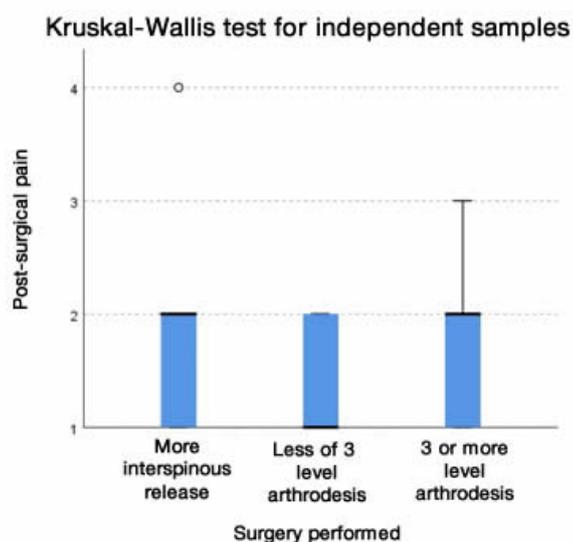
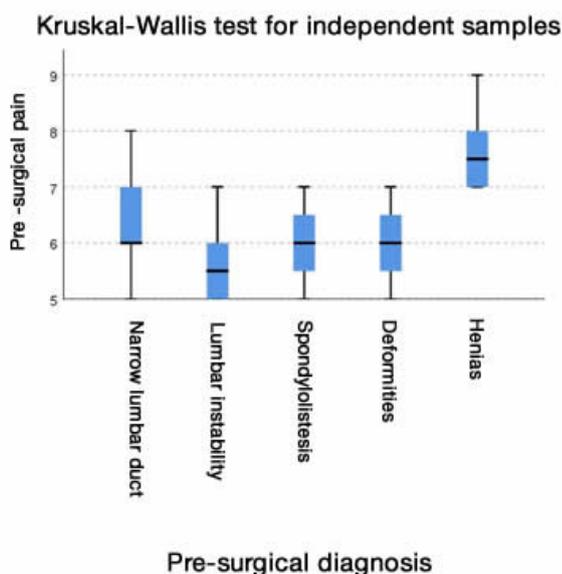


Figure 1: In the analysis of postoperative pain assessment, statistically significant values were seen (Friedman $P < 0.05$) in patients who received clonidine Intrathecal, which had a perception of minor pain in controls at 4, 8, 16, and 24 Hrs, but that was matching at the end of the last control (Figure 2).

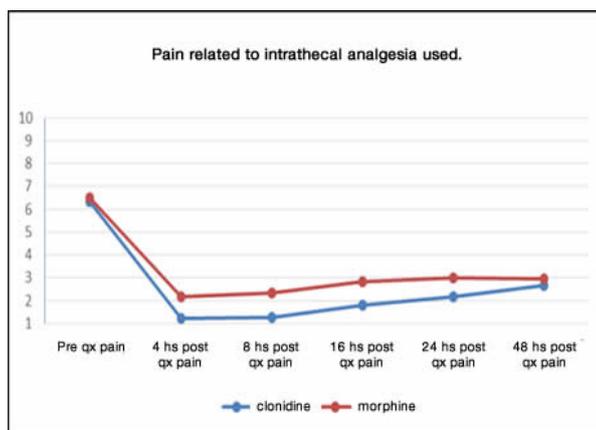


Figure 2: The assessment of the adverse effects analyzed, related to the use of intrathecal analgesia, was seen that the pruritus ($p = 0.166$), oxygen denaturation ($p = 0.952$), hypotension ($p = 0.602$) and bradycardia ($p = 0.913$), not statistically significant relevance (p less than 0.05), in the relationship between the application of clonidine or intrathecal morphine.

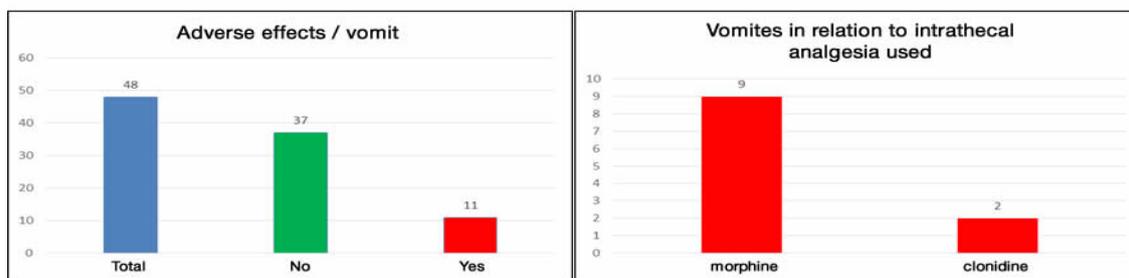


Figure 3: Adverse effect - Vomiting.

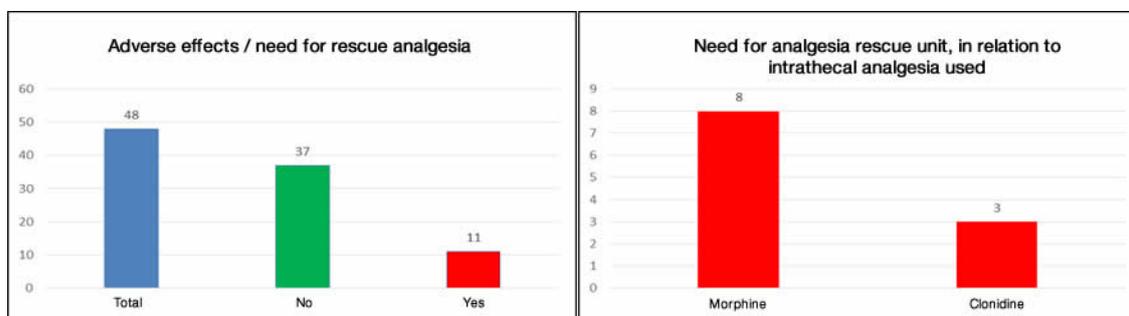


Figure 4: Adverse effect- pain rescue.

While the vomiting ($p = 0.025$) and the need for a pain rescue unit ($p = 0.047$) if they had a statistically significant assessment, in favor of clonidine, although with a low relationship, according to the Lambda de Figure 3 and Figure 4.

Discussion

It is essential to have early rehabilitation in a patient under column surgery, a strategy used by column surgeons is intrathecal analgesia due to the accessibility of the Tegal sac and the reliability of the procedure [5], this strategy has shown to offer a post-adequate short-term operation and reduces the consumption of painkillers for pain management [6]. Most surgeons who use this strategy use intrathecal morphine given their greatest popularity, although there are several studies that report side effects related to opioid use, such as respiratory depression, pruritus, and urinary retention [7].

This work sought to see the effects of the use of intrathecal morphine and compare them with another alternative which is the

use of intrathecal clonidine, valuing pain management such as the presence of side effects. Work such as Pendi A, et al. (2017) [8], made a meta-analysis, where they stressed that they were limited by small samples sizes in the use of intrathecal analgesia, this work presents a representative sample with 48 patients after purification by the criteria exclusion in patients with revision, scoliosis, tumor, fractures or infectious surgeries since they could have another perception of pain.

Pathologies, lumbar narrow duct, lumbar instability, spondylolisthesis, deformities and lumbar hernias were taken into account, where EVA was seen in patients with a diagnosis of lumbar hernia, but Owesry had no statistically significant difference between different pathologies Unlike Azimi P et al. (2017) [9], where patients with lumbar hernia have a major, statistically significant Owesry. And it was correlated with the surgery performed according to post-operative pain that also did not show a significant difference between the valuation of its pain and the magnitude of the surgery performed.

The post-operative pain variable, meta-analysis studies such as Erif



Pendi and ET on the use of intrathecal morphine or that of Elia N, et al. (2008) [10], of intrathecal clonidine [10], refer analgesia with an action of between 6 to 12 hours, although they stand out a short follow-up in the time of the patients analyzed. Our study was followed by 48 hours post-operative where in the first 24 hours the intrathecal clonidine had better post-operative pain management, and less need for pain rescue analgesia, although both medications had averages on the EVA scale of EVA of 1 to 3 points.

The assessment of side effects of several works reports that intrathecal morphine could trigger vomiting, pruritus, respiratory depression, urinary retention and clonidine hypotension, bradycardia. The study valued these variables, with the exception of urinary retention since patients graduate with an operating room with a bladder probe placed in the preoperative. The study by Gwartz KH, et al. (1999) [11], reported 3% respiratory depression, 25% vomiting, and 62 to 94% pruritus, and the study of Khezri MB, et al. (2014) [12], reported cases of bradycardia and hypotension at high doses of clonidine.

In our work only the vomiting had a statistically significant relevance comparing both medications, with a P less than 0.005 in favor of clonidine, where only 2 patients presented this adverse effect, in addition to the dose that the doses used were for safe use, without the presence of Complications that put the patient's life at risk, beyond that it was not designed to study this phenomenon.

Conclusion

The work showed that intrathecal analgesia with morphine or clonidine is a useful tool for postoperative pain management in lumbar column surgeries later, it is easy and safe to administer, but clonidine that presents greater effectiveness for the management of the management Postoperative pain and with less presence of adverse effects and at the doses used did not present risks to the patient's life.

Declarations

The authors declare not having conflicts of interest of any kind, that the work has been approved by the responsible ethics committee in the workplace, and do not declare means of financing of the work done.

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