

Dexmedetomidine for Reducing Opioid use in Laparoscopic Procedures

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Abstract

Most people who are going to undergo a surgical procedure want to receive the best treatment possible. Desirable outcomes are always having as little pain as possible, getting back home as quickly as possible, and not having much nausea or other adverse effects. Some of these adverse effects could be from the surgery itself but also could be from the anesthesia provided. For this reason, it is critical that anesthesia providers know the best anesthesia practices to facilitate the best treatment for their patients. The efficacy of dexmedetomidine in patients undergoing laparoscopic surgery to increase satisfaction with some of these desired effects, as mentioned above. The PICO question: Do adult patients who have laparoscopic procedures (P) who receive dexmedetomidine during the perioperative period (I) have lower pain scores in the PACU (O) compared to adult patients having laparoscopic procedures who do not receive dexmedetomidine (C)? Utilizing this question, a focused literature search was conducted and found that it is statistically significant that dexmedetomidine does cause a reduction in the use of opioids, which helps facilitate faster recovery times, less pain after surgery, and less nausea and vomiting. This information was provided and shared with anesthesia providers at a hospital in the South East area. This hospital had a strong basis of knowledge regarding dexmedetomidine and used the drug frequently. There was not any statistically significant increase in the use of dexmedetomidine during laparoscopic cases.

Keywords: Dexmedetomidine, Laparoscopic procedures, Opioids

Introduction

Laparoscopic procedures have become a frequently used surgical practice for a variety of procedures and is a technique that is used across the lifespan. Most, if not all, laparoscopic procedures will require intubation with an endotracheal tube requiring the patient to be paralyzed for the placement of the breathing tube. Anesthesia providers use an opioid to help keep the patient comfortable during surgery. Dexmedetomidine can aid in controlling a patient's pain due to its synergistic effects. This, in turn, can allow anesthesia providers to use fewer opioids, allowing quicker wake-up times and better recovery.

Dexmedetomidine is utilized for sedation and analgesia in the perioperative setting. Dexmedetomidine is a presynaptic alpha2 agonist that binds to adrenoreceptors to inhibit the release of norepinephrine from the presynaptic postganglionic sympathetic neurons. Inhibition of the sympathetic outflow prevents pain transmission and enhances pain modulation, providing the desired analgesic effect in surgical patients (Zhang et al., 2021).

These benefits lead to the discussion of the PICO question: Do adult patients who have laparoscopic procedures (P) who receive dexmedetomidine during the perioperative period (I) have lower pain scores in the PACU (O) compared to adult patients having laparoscopic procedures who do not receive dexmedetomidine (C)? The facility in which the intervention was conducted was ideal, as the availability of pre-drawn dexmedetomidine syringes were available to anesthesia providers. We identified the utilization of dexmedetomidine could be improved by further educating anesthesia providers on the benefits, techniques, and methods of dexmedetomidine use to reduce postoperative pain in laparoscopic procedures.

Hypotheses

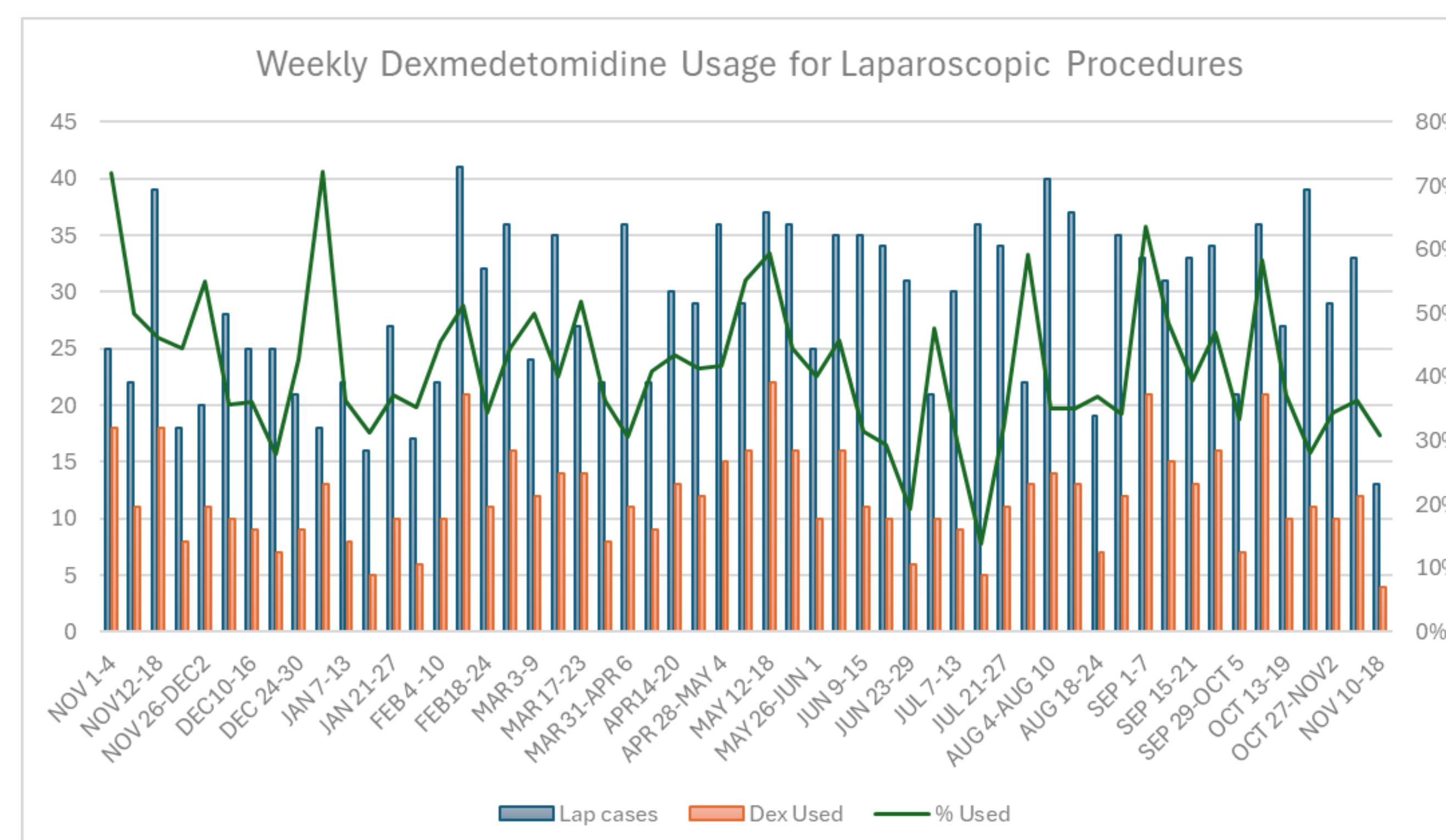
- The use of dexmedetomidine in patients undergoing laparoscopic procedures reduces post op pain, nausea and vomiting, the amount of opioids given, and enhances recovery

Methods

- The anesthesia department was given teaching on the use of dexmedetomidine during a monthly meeting and its advantages for laparoscopic procedures
- A brochure was distributive to the department
- Follow up sessions were provided to answer any further questions or concerns from the department
- The frequency of dexmedetomidine usage was then compared to before and after the brochure and education was provided

Results

In November, data was collected using a tool provided by the hospital's information system. First, the aim was to see how many total laparoscopic cases were performed in the measurement time frame. This total number of cases is shown in monthly form (Graph 1) and weekly form (Graph 3). Next, the aim was to search for how many of these performed cases had a provider give dexmedetomidine during the case. Graph 2 shows the amount of dexmedetomidine given during laparoscopic cases each month, while Graph 4 shows the same information over a weekly period. Graph 5 shows an overlap of all of this data. After analyzing the data, the first six months, before the presentation of information, dexmedetomidine was used an average of 38% of the time during laparoscopic procedures. After the presentation of information, the use of dexmedetomidine in laparoscopic procedures decreased to an average of 36% of the time over the following six months. Many factors could have contributed to this decline in usage, which will be discussed further.



Discussion

The results of the implementation of change did not show a beneficial improvement. Statistically, after the information was provided, it appears that the uses of dexmedetomidine went down, even though research has proven that it carries many benefits. With the rate of dexmedetomidine usage being nearly 40%, it is not easy to desire providers to push this even higher. At this facility, dexmedetomidine is readily available from the pharmacy. Providers simply must pick up a 5ml syringe from the pharmacy. The readily available dexmedetomidine could be attributed to a previous group's clinical practice improvement, which held similar instructions, although it was not focused on laparoscopic procedures.

The decision to limit dexmedetomidine use is amplified when there is pressure to increase turnover to optimize resources available not only in the operating room, but in the recovery setting as well. When following up with anesthesia staff, it was noted that some long recovery times were associated with the use of dexmedetomidine during the case by physicians. This resulted in the use of dexmedetomidine being discouraged by some physicians. Education for anesthesia staff included research that demonstrated when dexmedetomidine was used during the case, the use of opioids should be decreased during the procedure and postoperatively. A factor that should also be assessed as a contributing factor to the long recovery time should be the use of opioids postoperatively. When dexmedetomidine is added to the anesthetic, there should be a reduction in postoperative opioid administration; however, if recovery staff is unaware of dexmedetomidine administration or does not decrease the dose of postoperative opioids, prolonged recovery times can be expected. To optimize the benefits of dexmedetomidine post operative recovery room staff should also be educated on the benefits and research surrounding the use of dexmedetomidine.

Conclusions

- Dexmedetomidine usage before education was provided proves that it is common place at this facility
- Implementation of dexmedetomidine is multifactorial and require systemic adjustments in the practice of anesthesia

References

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