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A randomized double-blinded study to determine the effectiveness of utilizing intraperitoneal bupivacaine: Does it reduce post-operative opioid use following laparoscopic appendectomy?☆



DR. SAAD SHEBRIN (Kalamazoo, Michigan): The finding of this study is that instillation of local anesthetic agents at the conclusion of laparoscopic appendectomy compared to placebo has a significant effect on reducing postoperative pain, opioid use and length of stay. The etiology of postoperative pain after laparoscopic surgery is complex and that could be partly explained by the induction of visceral trauma and inflammation and peritoneal irritation due to carbon dioxide pneumoperitoneum with stretching and parietal peritoneum. Although attempts have been made in several trials to differentiate between various pain qualities and localization, the results and conclusions are difficult to interpret especially in the presence of an active pathologic process, such as an inflammation or perforation. Even within the same type of procedure, pain after laparoscopic surgery may vary in quality and localization, and this is reported in several trials as incisional, intraabdominal or referred such as shoulder pain.

In a large systematic review, including more than 2500 patients with more than 40 randomized controlled trials of local anesthetic compared with placebo or no treatment in control of postoperative pain after laparoscopic surgery, the results from using intraperitoneal local anesthetics revealed weak evidence for an effect on postoperative pain. Although some studies reported a statistically significant difference, the clinical significance, at least regarding pain scores, was questionable.

My questions to Dr. Miller. Question number one, the result of the studies suggest that there is a benefit from using local anesthetic – anesthesia on improvement of postoperative pain, especially in one hour postoperative, but there was no statistically significant difference at two, four and 12 hours postoperative. Excluding, though, an hour for postoperative pain assessment, it seems that there is no significant difference between the two groups, however, it was found that postoperative opioid significantly improved in bupivacaine group versus saline group. Given this result, could you say that this approach is cost effective when compared to other parenteral or oral narcotics during this short postoperative period.

Question number two, looking at the patients' demographics and medical history, can you tell how many of these patients were using narcotics before surgery, and how did you control for this confounding?

Question number three, I think you already answered part of it, ten patients, about 9% of the study or 10% were excluded. These are the nine patients in the saline group and one in the Bupivacaine

group who had perforated appendicitis. And this could significantly affect the overall result. Would there have been a difference in the result should the ten patients been included? Does this mean in case of perforated appendicitis, instillation of local anesthesia should not be used?

DR. MILLER: So in regards to the first question whether or not with the one-hour pain scores being improved from the use of local anesthetic, whether or not this is a cost effective measure, we didn't directly look at cost in the study. That's definitely something that could be studied in the future to see what is the cost of the opioids required over that course of one-hour versus the cost of Bupivacaine. However, we were happy that there was an overall reduction in the postoperative milligrams of I.V. morphine sulfate that were used as a whole. But as far as cost, we are not sure at this point.

The second question regarding the patients that may have been on opioid analgesics before enrolling in the trial. If they had reported any opioids when they were initially assessed, they were excluded from the study. So the only preoperative opioid use in the study was actually given in the hospital between admission and the time they went to surgery. That was difficult to control just based on, you know, OR availability and surgeon availability. Some of these patients go to the OR very quickly and some may go the next morning.

And then the last question about the exclusion of the perforated appendicitis patients, we ran the data both ways, with included and excluded. We found that either way, there is a reduction in postoperative opioid use and postoperative pain scores at one hour. So I think it is effective in perforated appendicitis. The only thing that no longer held was the length of stay difference, and I think you would have to have a bigger sample size to address that question.

DR. MARK NOLAN HILL (Highland Park, Illinois): Very interesting study. In looking at young complicated appendicitis, in my experience and my residents' experience, we really haven't had a great need for opioid analgesia. In other words, we give a lot of local anesthesia at the beginning of the case, and I'm a big fan of non-narcotic parenteral analgesia at the end of the case. In your patients who are uncomplicated appendicitis, do they really have – is it a significant problem in terms of their pain postoperatively? I mean, maybe one pill?

DR. MILLER: Yeah. Yes, it's true that most uncomplicated appendicitis are not overly painful. These patients all did receive I.V. Toradol at the end of the case. So we do employ, you know, multimodal strategy, as well.

As far as how much opioid they use, I believe it went from 9-mg – from 16 down to 9 of I.V. morphine sulphate equivalents, so that would be, you know – it's five or six Norco tabs, but that was only within the first, you know, 12 hours that we tracked that.

☆ (Presentation given by Clayton Miller, D.O.).

DR. HILL: And when did you send them home?

DR. MILLER: There were sent home as soon as they were tolerating a diet, ambulating and on oral meds. So their postoperative length of stay wasn't standardized. They were discharged when they were ready.

DR. CONOR DELANEY (Cleveland, Ohio): Congratulations on doing a randomized double-blinded trial. It's always hard to do. I had two questions. I apologize. I came in during your methods, but did you do a power analysis before the study? And, second, you

mentioned that the use of wound local anesthesia wasn't balanced or standardized between groups. Do you have data that you can look after the study and ensure that there was equivalent use between groups, because that would strengthen your results even if it's postop?

DR. MILLER: We did not have a pre-procedural analysis. As far as the subcutaneous local anesthetic that was given, we could probably go back in tomorrow and dig up which local anesthesia was used, but we have not done that yet.