Pain management following laparoscopy: Can we do better?

Numerous advantages have been reported when comparing open versus minimally invasive abdominal surgical procedures (laparoscopy), including earlier return of bowel function, decreased postoperative pain, quicker recovery, and earlier hospital discharge.[1] Although the magnitude of pain can be expected to be reduced when compared to open procedures, pain may still be a significant factor during the postoperative recovery period following laparoscopic surgery. Without effective treatment, this ongoing pain may delay recovery, mandate inpatient admission, and thereby increase the cost of such care. In addition to pain at the incisional and trocar insertion sites, there may also be shoulder and diffuse abdominal pain. Shoulder pain and diffuse abdominal pain may be due to peritoneal stretching and diaphragmatic irritation associated with carbon dioxide insufflation.[2]

Although in most circumstances pain is treated with an approach which uses parenteral opioids and nonsteroidal anti-inflammatory agents combined with local infiltration of the incisional sites, other novel techniques have been reported.[2-4] Given the problem of providing effective pain control, alternative agents such as pregabalin and ketamine have also been investigated.[5,6] Despite their efficacy, all parenteral medications may be associated with adverse effects. Therefore, there has also been interest in the use of topical peritoneal medications including local anesthetic agents. In these studies, the local anesthetic agent is aerosolized into the peritoneal cavity during the laparoscopic procedure.[7,8] Targeting the peritoneum topically makes sense as it has been shown that gas insufflation with increased intra-abdominal pressure results in peritoneal inflammation and neuronal rupture with a linear relationship between abdominal compliance during the procedure and the resultant severity of postoperative pain.[2] However, other investigators have suggested that there is no difference in the quality of analgesia when comparing the systemic (intravenous) administration and the peritoneal application of the local anesthetic agent.[9]

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Corticosteroids have long been known to modulate the inflammatory response and have been shown to decrease inflammation and provide analgesia in various clinical scenarios. In this issue of the *Saudi Journal of Anaesthesia*, Sarvestani *et al.*[10] investigate the efficacy of the intraperitoneal administration of hydrocortisone in a cohort of 60 adult patients undergoing laparoscopic cholecystectomy. Prior to the start of insufflation and the laparoscopic procedure, hydrocortisone (100 mg) which was diluted in 250 mL of normal saline was placed into the peritoneal cavity. Specific details as to how the medication was delivered are not contained in the report. Following its administration, the patients were then rotated in Trendelenburg, reverse Trendelenburg, left lateral decubitus, right lateral decubitus, and then supine position. They were left in each position for 2 min. Although the abdominal and shoulder pain scores were significantly lower in the hydrocortisone group in the recovery room and at 6, 12, and 24 h postoperatively, the difference in the scores was less than 1 on a 0-10 scale. The authors did note more than 50% decrease in postoperative meperidine requirements in patients who had received intraperitoneal hydrocortisone. Additionally, patients who received hydrocortisone did not require parenteral opioids after the 12th postoperative hour whereas ongoing opioid analgesia was required for the duration of the 24-h study period in the placebo patients. No difference was noted in the frequency of nausea and vomiting, length of hospital stay, time to return of bowel function, time to unassisted ambulation, and time to first oral intake.

Although the authors are to be congratulated on this prospective, placebo-controlled study, one immediately wonders if the effects of the hydrocortisone are local or related to systemic absorption as other authors have demonstrated the efficacy of intravenous corticosteroids in decreasing pain following laparoscopic surgery. Lim *et al.* randomized 120 patients scheduled for laparoscopic cholecystectomy into one of three groups: Normal saline 1 h before anesthetic induction and immediately after the resection of gall bladder, dexamethasone 8 mg 1 h before anesthetic induction and normal saline after resection of the gall bladder, and normal saline 1 h before anesthetic

induction and dexamethasone 8 mg after resection of the gall bladder.[11] Pain scores and opioid requirements were lower in the two groups that received dexamethasone compared to the placebo group. Similar findings have been reported by several other investigators.[12-14] Given these findings, one wonders about the cost and manpower issues of spending an extra 10 min in the operating room per patient as the hydrocortisone is administered (2 min each for each position). We also wonder how quick our surgical colleagues would be to adopt this technique and wait while hydrocortisone is distributed throughout the peritoneal cavity.

Although there are numerous advantages related to minimally invasive surgery, we have learned that the insufflation required can have significant deleterious effects on both the intraoperative and postoperative course of these patients. When considering the issue of pain, both its quality and location have changed when compared to open procedures. For those involved in the everyday care of these patients, our postoperative pain regimen continues to rely heavily on the use of opioids, nonsteroidal anti-inflammatory agents, and acetaminophen. The study in the current issue of the *Saudi Journal of Anaesthesia* brings to light the potential utility of corticosteroids, whether administered into the peritoneal cavity or intravenously. Although these agents are routinely administered in an attempt to decrease postoperative nausea and vomiting, their analgesic effects should not be dismissed. Given the mechanisms involved in nociception related to laparoscopy, modulation of the inflammatory cascade appears warranted. As we continue to strive to improve the analgesia and facilitate the postoperative outcome following laparoscopic procedures, future studies are needed to address the optimal combination of medications to provide postoperative analgesia, as well as the potential role for regional anesthetic techniques.

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