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Erector spinae plane block for management of acute on chronic pancreatitis pain

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Introduction

Acute pancreatitis is an inflammatory reaction of the pancreatic tissue. The two most common causes of acute pancreatitis are alcohol and cholelithiasis. The incidence of acute pancreatitis ranges from 5 to 80 cases per 100,000 people annually and this number has increased in recent years.[1]

Once an individual experiences an episode of acute pancreatitis, he or she becomes more susceptible to future episodes.[2] Nearly half of patients with alcohol-incited pancreatitis experience a recurrence, regardless of intervention.[2] Patients with gallstone pancreatitis have a 34% to 61% chance of experiencing a recurrent episode.[2]

Current clinical management of abdominal pain in the mid epigastric region due to acute pancreatitis is varied. The pathophysiology that produces the pain associated with acute pancreatitis is not yet fully understood. Barring any contraindications, most patients will receive a multimodal analgesic regimen that includes opioids, acetaminophen and nonsteroidal anti-inflammatory medications. In recent years, different regional analgesic methods, such as epidurals, celiac plexus blocks, transversus abdominis plane blocks, thoracic paravertebral blocks, and quadratus lumborum blocks, have been utilized to control acute pancreatitis pain. This case series demonstrates why erector spinae plane blocks (ESPBs) are another effective alternative for pain management in patients suffering from the severe abdominal pain associated with acute pancreatitis.

Materials and Methods

All cases are devoid of identifiable patient information and are exempt from IRB review requirements as per University of Texas policy.

Results/Case Report

Case 1: A 35-year-old 23-week pregnant female with a BMI of 24 presented with acute pancreatitis. She had a past medical history (PMH) of chronic opioid use and polysubstance abuse disorder for chronic pancreatitis. At the time of consultation, on hospital day 2, she had failed opioid escalation strategies for pain control. Bilateral ultrasound-guided T8/9 ESPBs were performed with 30ml of 0.25% bupivacaine and 3mg preservative free (PF) dexamethasone on each side. Prior to ESPBs, the patient received 4.8mg via hydromorphone patient-controlled analgesia (PCA) (MME 19.2). Numeric pain scores

decreased from 9/10 to 4/10. After the ESPBs, she required 40mg of oxycodone (MME 60) over the next 24 hours. The blocks were then repeated per patient's request with complete resolution of pain. She required zero opioids for her final 16 hours in the hospital before discharge.

Case 2: A 22-year-old male with a BMI of 23 presented with acute pancreatitis. He had a PMH of depression and chronic pancreatitis. He was on hydromorphone patient-controlled analgesia (PCA) and required a total MME of 51.2 over 24 hours at the time of consultation. Bilateral ultrasound-guided T8/9 ESPBs were performed with 30ml of 0.25% bupivacaine and 3mg PF dexamethasone on each side, and the patient only required 6mg of hydromorphone (MME 24) via PCA after the ESPBs. He received a total of 1mg hydromorphone (MME 4) in the 24 hours post-ESPB, and received an identical block without requiring any additional opioids until discharge.

Case 3: A 31-year-old female with a BMI of 25 presented with acute pancreatitis and pancreatic pseudocysts. She had a PMH of necrosectomy, hypertension, ectopic pregnancy and alcohol use disorder. At the time of consultation, she required 4mg of hydromorphone, 12mg of morphine, and 400mg of tramadol (total MME 68) over 24 hours. Bilateral ultrasound-guided T8/9 ESPBs were performed with 30ml of 0.25% bupivacaine and 5mg of preservative-free dexamethasone. Her pain decreased from 10/10 to 6.3/10, and she received 25mg of oxycodone and 600mg of tramadol (total MME 97.5) over the next 24 hours.

Discussion

The pathophysiology of acute pancreatitis results in inflammatory mediators such as leukotrienes, arachidonic acid metabolites, bradykinin, and proteases, each of which are factors known to stimulate primary sensory neurons. The pain is thus theorized to be the consequence of pancreatic primary sensory neuron stimulation and the subsequent release of the tachykinins substance P and calcitonin-gene-related peptide. Patients with acute pancreatitis will experience referred pain along dermatomes T6-T9 since the cell bodies for these pancreatic viscerosensory pain axons lie within the T6-T9 dorsal root ganglions.[2] The patients in our case series experienced relief of visceral pain after receiving ESPBs. ESPBs likely cause paravertebral spread because its complications include Harlequin syndrome, which is an autonomic neuropathy that occurs after T3 ESPBs, and bilateral sensory deficits after T9 ESPBs.[3] We postulate that this block is effective as local anesthetic spreads to the nerve roots that form the sympathetic plexus.[4,5] This anesthetic distribution ultimately results in an abdominal visceral analgesia that makes ESPBs advantageous to other thoracic interfascial plane blocks.

Single-shot ESPB were performed because the nursing units these patients were admitted to do not accept indwelling peripheral nerve catheters. Placing a continuous erector spinae plane (ESP) catheters with the option of patient controlled regional anesthesia local anesthetic delivery would have been ideal. Due to the success of the ESPBs to control acute pancreatitis pain, a multidisciplinary team consisting of Regional and Acute Pain (RAPM), Internal Medicine, Gastroenterology, and nurses worked together to create a protocol that includes ESP catheters. The RAPM service trained the nursing managers and educators on how to manage indwelling catheters, infusion pumps, and gave special training on side effects specific to ESPBs as well as local anesthetic toxicity.

CONCLUSION:

ESPBs at T8/9 results in significant pain control in patients suffering from acute pancreatitis. This may be due to spread of local anesthetics to the sympathetic nerve roots that form the celiac plexus.

Acute pancreatitis is a recurrent process, and thus, patients are not opioid naïve. The ESPBs and ESP catheters are a viable option as part of the multimodal pain regimen for pain management of acute pancreatitis.

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Disclosures

No

Tables / Images