Case Report

Transversus abdominis plane block for postoperative analgesia in a symptomatic bronchial asthma patient-a case report

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Abstract

An emergency appendectomy for acute appendicitis with severe acute bronchial asthma was in a 15 years girl under subarachnoid block. Transversus abdominis plane (TAP) block using landmark technique was administered for postoperative analgesia on completion of surgical dressing. After recovery from anaesthesia paracetamol 500 mg suppositories six hourly was given for analgesia but was not enough effective. Then in ICU ***Transversus Abdominis Plane*** *block continued again and her pain subsided significantly (4/10 at rest and 6/10 on coughing). Thereafter she could cough effectively and respiration smoothly.After 48 hours patient was shifted to ward and discharged on 7th post operative day uneventfully. Because of simplicity, safety and low cost TAP block may offer an effective alternative for postoperative analgesia. Use of ultrasound-guided technique as in other regional technique will increase its safety profile.*

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Introduction

Emergency surgical procedures in patients with symptomatic bronchial asthma always present a unique set of challenges to the anaesthesiologists during perioperative period. Provision for effective postoperative analgesia is essential to relief pain and to facilitate effective cough and respiration. Use of opioids for postoperative analgesia in patients with severe acute asthma is controversial due to their respiratory depressive effect on central nervous system. Non-steroidal anti-inflammatory drugs (NSAIDs) are contraindicated in those patients as these drugs block the synthesis bronchodilator group of leukaetrins. Transversus abdominis plane block is a promising new regional anaesthetic technique with a potential for wide range of application. [1-4] Recent randomized trials have demonstrated the efficacy of transversus abdominis plane block in providing postoperative analgesia after abdominal surgery.[1] We report the effectiveness of TAP block as postoperative analgesic technique in a girl with symptomatic bronchial asthma after appendectomy.

Case Report

A 15-year old girl brought to emergency room of Naval Hospital, Khulna in a state of severe respiratory distress with pain over right iliac fossa for 12 hours. She was diagnosed as a case of acute appendicitis with severe acute bronchial asthma and was placed for emergency appendectomy. She was a known case of bronchial asthma for 7 years and was on irregular medication. Cardiovascular examination revealed 110 beat per minute and non-invasive arterial blood pressure 110/70 mm Hg. She was tachyponic with respiratory rate 32 per min and was maintaining SpO_2 93 ± 2% on room air. She was referred for intensive management of bronchial asthma in intensive care unit (ICU). In ICU she was aggressively treated with intravenous hydrocortisone, salbutamol and ipratropium nebulization, parenteral antibiotic and chest physiotherapy. After 4 hours of intensive care management respiratory distress decreased significantly but she developed rise of body temperature and was complaining of more intense abdominal pain. Decision was taken to perform

emergency appendicectomy with this condition. She was accepted in ASA physical status IV. After a preload of 500 ml Ringer's solution, appendectomy was performed under subarachnoid block at L_2 and L_3 interspace with 0.5% hyperbaric bupivacine 3 ml. Appendectomy was done through Lanz's incision. Peroperatively the patient had one episode of respiratory distress, treated with sulbutamol and ipratropotium nebulization. During the whole procedure in the operating room the patient was haemodynamicaly stable. After the placement of dressing pad over the surgical wound, TAP block was performed through the lumber triangle on right side using landmark technique with 0.25% plain bupivacine 20 ml. The patient was transferred to ICU at the end of all procedures.

Post operatively analgesia was maintained with paracetamol 500 mg suppositories six hourly avoiding non steroidal analgesics. Intravenous hyosine –N –butyl bromide 10 mg was added eight hourly for the first 24 hours. Tramadol 1.5 mg per kg body weight was used intravenously as rescue analgesic. For management of bronchial asthma she was nebulized with salbutamol and ipratropium 8 hourly. Initially she tolerated active chest physiotherapy and was able to clear her respiratory secretions effectively. Post operative pain was assessed by the use of verbal rating on a visual analogue scale (VAS) of 0 to 10. After 14 hours of placement of TAP in the operating room, her pain scores increased substantially (7/10 at rest and 8/10 on coughing) along with respiratory distress. She was finding it difficult to cough. After a dose of rescue analgesic with tramadol intrvenously, her pain score reduced to 4/10 at rest and 6/10 on coughing, but not enough to be able to cough effectively. Then in ICU under all aseptic precaution TAP block was performed again using landmark technique. Thirty minutes later her pain subsided significantly and pain score became 1/10 at rest and 2/10 on coughing. She was able to cough effectively and allowed her to undergo chest physiotherapy again. Thereafter patient was slept for 10 hours, pain free and could take care of herself. After 48 hours patient was shifted to ward and discharged on 7th post operative day.

Discussion

Effective analgesia has been shown to reduce the postoperative stress response and accelerate recovery from surgery. [5] There has been an increasing need to find effective analgesic techniques that have lower risks. The use of sensory block of the anterior abdominal wall with local anaesthetis for postoperative analgesia is an attractive option, because of its simplicity, safety and low cost. The TAP block is a new regional anaesthetic technique that blocks the abdominal neural afferents by introducing local anaesthetic into the neurofascial plane between the internal oblique and the transversus abdominis muscles. The technique described based on the so called Petit triangle. The borders of "Petit" triangle formed of latissmus dorsi muscle posteriolrly, external oblique muscle anteriorly and iliac crest forming the base. McDonnell et al described the block using these landmark technique. [13] Hebbard et al subsequently described an ultrasound-guided technique for the TAP block with low complication rate. [14]

Although epidural techniques can provide excellent analgesia but rare complications (epidural haematoma and abscess) are potentially catastrophic. [6] Opioid-based analgesic regimens can also provide satisfactory analgesia, but in large doses may be associated with adverse effects including sedation, respiratory depression, paralytic ileus and nausea and vomiting. Non-steroidal anti-inflammatory drugs are relatively contraindicated in our patient. Our patient had a high risk for early postoperative respiratory failure resulting from basal atelectasis caused by pain and inability to clear secretions on a background of chronic obstructive airway disease. Recently efficacy of transveresus abdominis plane block in postoperative analgesia after abdominal surgery has been published in different literature. [1-4] TAP blocks eliminate somatic pain relating to the surgical incision but do not treat visceral pain. However in our patient TAP block has provided analgesia for 14 hours postoperatively. Addition of hyosine-n-butyl bromide may have role in reliving visceral pain. First rescue analgesic was administered at 14 hour postoperatively. This prolonged effect of TAP block may be due poor vascularization of transverses abdominis plane.

In our patient pain was not relived adequately with a rescue dose of tramadol, moreover she was in symptomatic asthma. Young age with respiratory distress may be the reason to make her intolerance to pain. After the placement of TAP block for the second time in the ICU her pain relived significantly

and could cough effectively. Singh et al. demonstrated that bilateral TAP blocks in addition to noninvasive positive pressure ventilation was effective in the management of a 74-year-old patient with impending respiratory failure resulting from excessive pain and narcosis following emergency laparotomy.[7] Similarly effectiveness of TAP block as rescue analgesic has been shown by Niraj G et al. and Petersen PL et al. [8-9] The duration of opioid sparing effect after a single shot injection into the transversus abdominis plane has been reported to range from 24 to 36 hours. [10-11]These features of the TAP block may have aided the recovery of patients after emergency surgery. Analgesic effect may be due to systemic absorption of local anaesthetic in addition to blockade of nerves in transverses abdominis plane. [12] General risks of regional anaesthesia like inadvertent intravascular injection, local anaesthetic toxicity, infection, and poor/failed block are also applicable to TAP block. Complications of TAP block techniques are rare. This case report demonstrates the utility and safety of transverses abdominis plane (TAP) block in postoperative analgesia of symptomatic asthma patient after appendectomy.

Conclusion

TAP block provides prolong abdominal wall analgesia and thus avoids opioid related side effects. This is especially beneficial in patients that are particularly sensitive to the respiratory depressant effects of opioid. TAP block is relatively easy, safe techniques requiring less nursing supervision for prolong period of time. Because of simplicity, safety and low cost TAP block is likely to be an effective adjunct to multimodal postoperative analgesia for abdominal surgery.

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