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## Case Series

### Case series: Opioid free anaesthesia

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#### ABSTRACT

Opioid free anaesthesia (OFA) is a technique where no intraoperative systemic, neuraxial or intracavitary opioid is administered with anaesthetic. Opioid free analgesia similarly avoids opioids in the perioperative period.<sup>1</sup> Opioids in perioperative period which is associated with various adverse effects and poor surgical outcomes. Opioids in perioperative period is associated with respiratory depression, impaired gastrointestinal function, postoperative nausea and vomiting (PONV), Urinary retention, delirium, and potential for opioid addiction. Now many non- opioid analgesics are currently available that have less side effects and lower potential for addiction. Replacing opioids with other analgesics will not only reduce opioid addiction but will also lead to better perioperative outcomes and enhanced patient recovery.<sup>2</sup> Recently opioid sparing strategies have been emerged and non opioid based multimodal strategy is being used worldwide.

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## 1. Introduction

Opioid medications have been most commonly used perioperatively for relieving pain for a long time. Intraoperatively opioids are used to achieve haemodynamic stability by blocking sympathetic response during surgery. While they are effective at relieving somatic pain, unfortunately, do not eliminate neuropathic pain and have profound potential for developing addiction.<sup>2</sup> Substituting opioids with non opioid analgesics should be of great priority for anaesthesiologists. In this article we have substituted opioids with alternate analgesics during perioperative period and outcome associated with it.

## 2. Case Reports

### 2.1. Case 1

A 45-Year male diagnosed as acute cholecystitis posted for emergency laproscopic cholecystectomy. Patient had no history of Hypertension, Diabetes, Chronic obstructive pulmonary disease(COPD), with good effort tolerance. Investigations showed TSH 70 mIU/L (no signs and symptoms of hypothyroidism). Rest of investigations are within normal limits. Preoperatively IV midazolam 1 mg, IV paracetamol 1gm, IV dexamethasone 8mg, IV dexmedetomidine 1mcg/Kg was started 15 minutes before procedure. Anaesthesia was induced with propofol 1 mg/kg, atracurium, IV lignocaine 3 mg/kg given before intubation. After intubation Maintenance dose of dexmedetomidine 0.5 mcg/Kg/Hr was continued and maintained with sevoflurane (MAC 0.8 to 1). At the end of surgery local wound infiltration with bupivacaine 0.5 was infiltrated. Vitals were stable throughout the procedure. Patient was extubated after the surgery. Dexmedetomidine infusion was continued 6

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hours post procedure and VAS <2 was maintained.

### 2.2. Case 2

A 32-year-old male (weight 101 kg, BMI 34.5) posted for laproscopic left hemicolectomy. Patient had history of Hypertension, Diabetes, and on CPAP for sleep apnea. Patients investigations are within normal limits. Apart from regular medications IV dexmedetomidine 1 mcg/kg was started 20 minutes before surgery. Patient was induced with propofol 1.5 mg/kg body weight, atracurium 0.5 mg/kg IV lignocaine 2 mg/kg, IV Magnesium 30 mg/kg was given. Patient was intubated with videolaryngoscope. General anaesthesia was maintained with sevoflurane (MAC 0.8 TO 1) and continuous infusion of magnesium 20 mg/kg/hr and lignocaine 2 mg/kg/hr and supplemented with NSAID'S. Bupivacaine 0.5 was infiltrated at port site. Vitals were stable throughout the procedure even during extubation. ERAS was started soon postoperatively. VAS score 1 and 4 h after surgery was 4/10. after 8, 10, 12, 24 h pain score was 2/10 on rest.

### 2.3. Case 3

A 78-year-old man diagnosed as irreducible right inguinal hernioplasty posted for emergency open hernioplasty, with history of Diabetes, hypertension, s/p CABG 15 years ago, history of CVA with no residual deficit. Patient is on antiplatelets (clopidogrel 75 mg) Beta blockers (metoprolol 25 mg) apart from regular medications. 2D echo with EF 45, basal heart rate of 60 per minute. Rest of the investigations are with normal limits. Patient was induced with propofol 1.5 mg/kg body weight, atracurium 0.5 mg/kg IV lignocaine 3 mg/kg, Magnesium sulphate 30 mg/kg and lignocaine infusion 2mg/kg/hr, and regular medications were continued. At the end of surgery ultrasound guided transverse abdominis plane (TAP) block and local infiltration of bupivacaine was infiltrated around the incision site. Patient was extubated smoothly. Post surgery patient was comfortable and VAS score was 2/10 for first 24 hrs.

### 2.4. Case 4

A 58 years old male (weight 56) diagnosed as periampullary carcinoma posted for whipples procedure, with history of diabetes, hypertension. Thoracic epidural catheter was placed preoperatively at T9-T10 level. Apart from regular medications IV dexmedetomidine 1 mcg/kg was started 20 minutes before surgery. Patient was induced with propofol 1.5 mg/kg body weight, ketamine 0.5 mg/kg atracurium 0.5 mg/kg IV lignocaine 2 mg/kg, was given. Epidural infusion of bupivacaine 0.125 was started 15 minutes after induction and continued intra and in postoperative period. Post operative pain score was 3/10 during strain and 1/10 at rest. Apart from epidural infusion NSAIDS and paracetamol

was continued in post operative period.

### 2.5. Case 5

A 32 years old female with known case of Crohn's disease (weight 50 kgs) on opioids (opioid dependent) for pain management posted for laproscopic ileocaecal resection with no other comorbidities. Opioids were stopped and tablet Clonidine HCL 50 mcg OD and tablet Tramadol sos was started and was continued for 15 days then tablet Naltrexone 25 mg OD was started as maintenance therapy. Patient was premedicated with 2 mg midazolam, 0.2 mg Glycopyrolate, Paracetamol 1 gm and Dexmedetomidine 0.6 mcg/kg was started. Induced with ketamine 80 mg, atracurium 0.5 mg/kg and was maintained with sevoflurane. Surgery lasted for 3 hours. Local wound infiltration of 0.2 ropivacaine was supplemented. Dexmedetomidine infusion was continued intraoperative period and was continued postoperatively. Patient complained of pain postoperatively 4 hours after surgery. Postoperative pain was managed with IV diclofenac 75 mg, Paracetamol 1 gm 6<sup>th</sup> hourly and dexmedetomidine. Tablet Naltrexone 25 mg was restarted in postoperative period.

## 3. Discussion

Opioid free anaesthesia offers certain advantages, including smooth and fast recovery and preventing opioid related side effects. The most common side effect of opioid use is respiratory depression especially in patients with obesity, sleep apnoea, COPD. Impaired gastrointestinal function due to ileus may lead to anastomotic leak, distension further leading to atelectasis in lung bases, which often leads to respiratory failure. Opioid induced gastroparesis is also significant contributor to aspiration. Opioid induced PONV, pruritis are significant problems encountered in recovery room. Urinary retention leading to catheterization and urinary tract infections. Post operative delirium induced by opioids are commonly due to opioid use. Opioid depress cell mediated immunity and in some studies have found to be associated with increased tumor recurrence rate after cancer surgery.<sup>3,4</sup>

By attenuating opioid induced hyperalgesia postoperative use of opioids and their effects can be minimized.<sup>5</sup> Further opioid free anaesthesia prevents addiction due to overuse of opioids in postoperative period.<sup>6</sup> Dexmedetomidine is widely used along with ketamine, magnesium sulphate, local anaesthetics, Paracetamol, NSAID'S for opioid free anaesthesia. Dexmedetomidine is highly selective alpha 2 adenoceptor which produces dose dependent sedation, anxiolysis, and analgesia, perioperative sympatholysis without respiratory depression.<sup>7,8</sup> It also attenuates haemodynamic stress response to intubation, extubation by sympatholysis and potentiates anesthetic effect of all anesthetic agents

irrespective of mode of administration<sup>9</sup> but hypotension and bradycardia may occur due to decreased release of noradrenaline from sympathetic nervous system. For the above cases except case 3 we have used dexmedetomidine as patient is on Beta blockers and dexmedetomidine was avoided to prevent risk of bradycardia. In all the cases posted above vitals were stable throughout the procedure. no major haemodynamic changes were noted during intubation, incision, extubation and during recovery. By avoiding opioids perioperatively we can prevent long term effects not just limiting to overdose and addiction but we can prevent serious medical risks which includes hyperalgesia, immunosuppression, chronic constipation, erectile dysfunction, infertility, bowel obstruction, tooth decay secondary to xerostomia.<sup>10</sup> Studies have shown higher opioid related mortality due to overuse or overdosage.<sup>11</sup> Enhanced recovery after surgery (ERAS) protocol forms a feasible guide to implement Opioid Free Anaesthesia. It uses multimodal analgesia which includes regional anaesthesia, non opioid analgesics. The success of ERAS is mainly due to right combination of analgesia, with minimal post operative nausea, vomiting, early mobilization in postoperative period.<sup>12</sup> So opioid sparing strategies with usage of regional anaesthesia and multimodal pain management have been emphasized. Many patients with obesity, opioid addiction, elderly, major surgeries benefit with use of OFA.

#### 4. Conclusion

Opioid free anaesthesia in form of Dexmedetomidine, Magnesium sulphate, ketamine, local anaesthetics, NSAID'S offer numerous advantages and currently used as alternative to opioid based anaesthesia. These methods are safe and effective and can be used to administer anaesthesia to prevent adverse effects of using opioids. Despite with numerous advantages using opioid free anaesthesia there is very limiting data. Even as many evidences show advantages of OFA over opioid based anaesthesia still opioids are more favored due to many reasons.

#### 5. Source of Funding

None.

#### 6. Conflict of Interest

The authors declare no conflict of interest.

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