

Anaesthetic Management of High Risk Chronic Kidney Disease Patient for Continuous Ambulatory Peritoneal Dialysis Catheter Insertion with Omentectomy

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Abstract

A patient with Chronic Kidney Disease (CKD) having history of Ischaemic Heart Disease (IHD) and Interstitial Lung Disease (ILD) was planned for CAPD catheter insertion with omentectomy. Usually CKD patients requiring general anaesthesia (GA) or spinal anaesthesia present a number of challenges to anaesthesiologist. This patient carried high risk for general anaesthesia due to interstitial lung disease. We managed this high risk case with bilateral Transversus Abdominis Plane (TAP) block and spinal fentanyl with very low dose bupivacaine hyperbaric 0.5% (0.5 ml) to reduce perioperative morbidity. Anaesthesia technique was adequate for conduct of surgery with minimal supplementation and no complications noted in the perioperative period. It was observed that this technique may be a feasible alternative option especially in patients who carry high risk of morbidity with general anaesthesia/spinal anaesthesia with regular dose of bupivacaine.

Keywords: Renal Insufficiency; Chronic; Peritoneal Dialysis; Continuous Ambulatory; Fentanyl; Spinal Anaesthesia; TAP Block.

How to cite this article:

Parimala B. & Alka S. Deo. Anaesthetic Management of High Risk Chronic Kidney Disease Patient for Continuous Ambulatory Peritoneal Dialysis Catheter Insertion with Omentectomy. Indian J Anesth Analg. 2018;5(8):1412-15.

Introduction

Chronic kidney disease (CKD) patients are at high risk for anaesthesia. Our patient carried high risk for general anaesthesia (GA) in view of her interstitial lung disease (ILD). Spinal anaesthesia with regular dose of bupivacaine hyperbaric 0.5% is associated with significant hypotension. Transversus abdominis plane (TAP) block has been used for continuous ambulatory peritoneal dialysis (CAPD) catheter insertion; however, it provides only somatic analgesia to the abdominal wall and

not visceral analgesia. Hence, we combined opioid based low dose spinal anaesthesia (to prevent hypotension) with bilateral TAP block to provide anaesthesia for CAPD catheter insertion with Omentectomy.

This combined approach with minimal modification is a feasible alternative option for high risk CKD patients undergoing CAPD catheter insertion with Omentectomy. Review of literature (PubMed, Medline, Cochrane central register of controlled trials) reveals that this approach has never been reported earlier.

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Received on 18.05.2018, Accepted on 09.06.2018

Case Report

A 70 year old female patient, known case of CKD on haemodialysis (HD) was planned for CAPD catheter insertion with omentectomy. During pre-anaesthesia check-up (PAC) it was noted that she has hypertension (HTN), diabetes mellitus (DM), ischemic heart disease (post CABG status- 15years), ILD on treatment along with home oxygen therapy and bilateral central venous stenosis. Patient was undergoing HD through left femoral HD catheter. On examination height was 147cm, weight 46kg and airway showed Mallampatti 3 grading, short neck and edentulous. Patient's respiratory rate was 22/min, room air saturation (SpO₂) - 78% and with 3L Oxygen, it was 94%. ABG(with oxygen 3L/min) showed PH:7.42, PCO₂: 30.2, PO₂: 67.8, SaO₂: 94%, HCO₃:19.2. Chest x ray showed perihilar fibrosis and HRCT chest was advised; but not repeated as earlier CT confirmed ILD. Pulmonary function test (PFT) was advised but couldn't get report as patient was unable to follow instructions during PFT. Echocardiography showed EF 38%; LV-RWMA (LAD territory); severe PAH (PASP 67 mmhg) and grade 2 diastolic dysfunction. All blood tests (Haemogram, Electrolytes and Coagulation profile) except for S. creatinine of 3.52mg/dl were in normal range.

This patient was taken up for CAPD catheter insertion under ASA 4. Open surgical technique with infraumbilical incision is the practice for CAPD catheter insertion in our hospital. Anaesthesia plan A was subarachnoid block (SAB) with 0.5ml of bupivacaine heavy 0.5% plus fentanyl (25mcg) and bilateral TAP block. Plan B was general anaesthesia with laryngeal mask airway or endotracheal tube with controlled ventilation. Informed consent for anaesthesia taken and our regular anaesthesia consent includes consent for presentation/

publication. HD was done 12 hours prior to surgery and fasting of 12 hours was followed. In operation theatre, monitors (ECG, NIBP, SpO₂) connected and intravenous access secured. Central venous access was not planned in view of bilateral central venous stenosis. Invasive blood pressure was not possible as right radial artery was used during CABG and left radial artery was used for arteriovenous fistula creation.

Anaesthesia technique: Under asepsis, in sitting position, lumbar puncture was done in L3-L4 with 26G quincke needle. Free flow of cerebrospinal fluid (CSF) confirmed and Inj fentanyl 25µg (0.5ml) plus 0.5ml bupivacaine hyperbaric (Anawin) 0.5% (a total volume of 1ml) injected into CSF and patient put to supine position immediately. Heart rate, blood pressure, SpO₂ monitored on cardiac monitor. Before proceeding with TAP block it was noted that patient had sensory block up to T9 level; however, there was no motor blockade.

Under asepsis, the ultrasound (USG) linear probe was placed in transverse plane in the midaxillary line, between the lower costal margin and iliac crest; abdominal muscle layers identified and bilateral TAP block achieved using 22G 50mm stimuplex needle with 20ml of inj bupivacaine 0.25% on each side.

Supplemental oxygen at 5L/min was delivered to the patient. Surgery was started after 20 minutes of TAP block. Normal saline 500ml infused during the surgery. Patient was haemodynamically stable in the intraoperative period. Patient had pain score [visual analogue score (VAS)] of 3 during omentectomy and was supplemented with intravenous Inj midazolam 0.5 mg plus fentanyl 25mg. The duration of surgery was 2 hours. In the postoperative period, patient had pain score of 4 (VAS) at 3rd hour and was treated intravenously with Inj paracetamol 100ml. No further analgesics required in first 24 hours.

Table 1: Case details

Case	Age/sex	Comorbids	Sensory analgesia after spinal	Intraop analgesic supplementati on(Midazolam 0.5mg+fentanyl 125 µg i.v)	Duration of surgery	Postoperative analgesia(24 hrs)	Patient feedback
1	70/F	HTN, DM, IHD, ILD	T9	During Omentectomy	120min	1 dose paracetamol at 3 rd hour	No complaints; was very happy

Discussion

Dialysis has become the main mode of management of CKD. The two types of dialysis are HD and peritoneal dialysis (PD). PD offers patient survival comparable to or better than HD while preserving residual kidney function, empowering patient autonomy, and reducing financial burden. In patients with cardiorenal syndrome and uncontrolled fluid status, PD is of particular benefit, decreasing hospitalization rates and duration [1]. Studies have shown that omentectomy during CAPD catheter placement prevents catheter blockage thereby improves catheter survival [2]. Conventional laparotomy for insertion of CAPD catheter is routinely done under general anaesthesia [3] and recent authors have even used TAP block for the same [4].

Our patient with co-morbidities like IHD with low EF (38%) and ILD posed high risk for spinal/general anaesthesia.

Sympathetic blockade resulting in hypotension is an important consideration when using spinal anaesthesia. Compensatory mechanisms for spinal induced hypotension are impaired in patients with autonomic neuropathy [5]. The dose of bupivacaine used in the range of 12.5 mg to 15 mg for spinal anaesthesia is associated with significant sympathetic block [6]. Intrathecal opioids are synergistic with local anaesthetics and intensify sensory block without increasing the sympathetic block [7]. Fentanyl is used as an adjuvant with no major complications [8].

TAP block provides somatic analgesia for anterior abdominal wall. The aim of the TAP block is to deposit local anaesthetic in the plane between the internal oblique and transverses abdominis muscles. USG guided TAP block allows better localization and deposition of the local anaesthetic and also minimizes the risk of hematoma formation especially beneficial in CKD patients with compromised platelet function. It provides good analgesia from T10 – L1 following a single posterior injection [9].

Hence, we used spinal fentanyl (25µg) with low dose bupivacaine hyperbaric 0.5% (0.5ml) and bilateral TAP block for this high risk patient.

Ayedi, Met al. [10] used TAP block for postoperative analgesia during abdominal hysterectomy and concluded that TAP block with 0.25% bupivacaine significantly reduced pain after abdominal hysterectomy.

TAP block has been found to be superior to systemic analgesics in various abdominal surgeries [11,12].

Smaranjit chatterjee [13] used TAP block as technique of anaesthesia for CAPD catheter insertion. In their study, out of 52 patients, 11 patients had pain during the procedure requiring local anaesthetic supplementation with or without intravenous sedation.

In our case, a patient at high risk for anaesthesia was safely managed using a multimodal approach with least adverse physiological effects. The main advantage of this combined approach is that it avoids spinal induced hypotension and also minimizes respiratory complications in a patient with compromised lung function. However, the disadvantage we noted was that patient required supplemental analgesia during omentectomy. Hence, we suggest further research with more number of cases to assess whether this combined approach can be used as a sole anaesthesia technique for CAPD catheter insertion with Omentectomy.

Conclusion

Routinely, spinal and general anaesthesia has been used for CAPD catheter insertion with Omentectomy; however, both are known for complications in CKD patients. USG guided bilateral TAP block combined with opioid based low dose spinal anaesthesia can be used as a feasible alternative option for high risk CKD patients undergoing CAPD catheter insertion with Omentectomy.

Acknowledgement

Our sincere thanks to NU Hospitals for their support.

Source(s) of Support: Nil

Key Messages: “Opioid based low dose anaesthesia”

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