

Outcome of emergency Laparotomies done under subarachnoid block. An observational study

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ABSTRACT

Background and Aims: Prevalence of smoking and excessive consumption of alcohol is very high in rural parts of Telangana. The common complications due to this habit may lead to the development of COPD in smokers, as well as the development of gastro-duodenal ulcers. Perforation peritonitis is also very rampant in this part of India. It is well-known that smokers and patients with COPD have a higher rate of pulmonary related complications following abdominal surgery. Nonavailability of modern ventilatory facilities and even of Epidural kits at these areas is still a major concern as well as a challenge to the anaesthesiologists in these parts of India. Delayed diagnosis and late referral of abdominal emergencies to the referral centres makes it more difficult to manage and provide optimal care, however, due to poor financial status and critical conditions it is never easy to refer them to tertiary centres with these facilities. This study reviews the utility of spinal anaesthesia in such cases. **Methods:** We reviewed all cases of abdominal laparotomies conducted during the period of June 2008- May 2010. Total 56 cases were selected who were given spinal anaesthesia as a sole anaesthetic in left lateral position and were chronic smokers with evidence of COPD. 25 cases were of ASA grade IV and 31 were grade III. All cases were operated for upper GI perforation peritonitis. The outcome of these cases was recorded and analysed. **Results:** Intraoperative conditions were adequate with spinal anaesthesia alone for successful completion of the procedure in all cases except 2 (1.12%) cases needed GA due to prolong surgical time. None needed mechanical ventilation in the postoperative period, 2 patients developed pneumonia, and mean length of hospital stay was 7 days. There was no report of renal or respiratory insufficiency. **Conclusion:** Emergency laparotomies can be safely performed under Spinal anaesthesia, making it a safe option and alternative to GA at the centres without modern ventilatory care.

Key words: Laparotomy, postoperative outcome, spinal anaesthesia, COPD

INTRODUCTION

Compared to the normal population postoperative complications are 9.5 times more frequent in patients with pre-existing pulmonary diseases^[1]. In particular, patients with Chronic Obstructive Pulmonary Disease (COPD) have a very high mortality risk of 5-13 times^[2]. Postoperative pulmonary complications are highest among patients who undergo upper abdominal procedures^[3]. Due to no availability of modern ventilatory care and ICU care mortality rate was very high in the immediate

postoperative period. Such high mortality may be due to the effects of General Anaesthesia (GA) and improper mechanical ventilation of the already compromised lungs,

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as well as, excessive use of long acting opioids for severe pain control, which may further affect pulmonary function and leads to ventilator dependence.

Regional Anaesthesia (RA) may be an attractive and safe alternative to general anaesthesia since neuraxial blockade has minimal respiratory effects even at higher level block^[4]. Certain retrospective^[5] and prospective^[6,7] observational studies in the non-thoracic surgeries shows that patients with sever COPD5 as well as patients not selected for pulmonary pathology^[6,7] have better respiratory outcomes when neuraxial blockade is given rather than GA. Publications over the use of regional anaesthesia as a sole anaesthetic for upper abdominal surgeries are little, however, prospective randomized studies have been conducted which evaluate the outcome of combined general and regional anesthesia^[9,10]. A large matanalysis8 of prospective, randomised studies showed significant benefit to neuraxial blockade in a large surgical population, but the study grouped RA and combined RA/GA patients together. Studies of abdominal surgery patients comparing the combined approach with GA alone consistently have shown trends toward decreased rates of postoperative failure^[9,10], presumably due to the superior postoperative pain control provided by the regional technique.

Our study provides evidence that many upper abdominal surgical procedures thought to require GA may be safely and effectively performed using spinal anaesthesia alone. It may be seen that the postoperative course of these patients is incredibly smooth, allowing hospital discharge within several days of the procedure.

MATERIAL AND METHODS

Following institute's ethical committee approval records of surgical patients operated for perforation peritonitis from medical record section were reviewed. Patients who meet following criteria were selected

- 1) Chronic smokers of 45 years and above age.
- 2) Evidence of COPD on X-ray chest.

56 patients were identified (all male), and their records were reviewed to determine patient age, diagnosis, indications of surgery, type of surgery performed, American Society of Anesthesiology (ASA) classification, need of GA, need for mechanical ventilation, length of stay, and perioperative complications such as Hypotension, bradycardia, nausea and vomiting and respiratory depression or mortality.

Data was collected and analysed. Mean and percentage of the parameters were calculated with the help of astatistician.

RESULTS

The average age of patients was 61.07 years (Table 1). 37 patients were operated for gastric perforation, 18 patients for duodenal perforation and 1 was operated for ileac perforation. All the patients were assessed and 31 of them were ASA grade III, and 25 of them were classified as ASA grade IV. All the patients were optimized preoperatively after initial assessment by anaesthesiologist (dehydration, electrolytes, blood transfusion etc). Hypotension (>30% of fall from baseline) was noted in 22 patients (40%) and was managed with mephentermine 6mg and bolus IV fluids, only 8.8% (4) patients needed ionotropic support in the form of dopamine). Nausea and vomiting were recorded in 40% (22) and was treated with ondansetron 4mg. Bradycardia was noted in 16 patients (30%) and was treated with atropine 0.5mg. None patients had cardio-respiratory arrest in the perioperative period. Only 1.12% (2) patients needed GA due to prolong surgery and were successfully extubated on completion of the procedure. No patient needed mechanical ventilation in the postoperative period. Mean length of stay in HDU (High Dependency Unit) was 5 days. One (0.56%) patient have developed myocardial infraction on the 5th day of the procedure and was treated with Streptokinase and was discharged after 15 days. 5 (2.8%) patients were found to be anaemic and received blood transfusion on the3rd postoperative day. Two (1.12%) of the patients with a history of recent respiratory tract infections have developed Pneumonia on the 3rd day and were treated with higher antibiotics and discharged after 2 weeks. None of the patients has found to developed deep vein thrombosis, respiratory depression or renal failure. Overall mortality was zero. (Table 2) Spinal block level attended was up to T4-T5 level, Intraoperative relaxation was adequate for successful completion of procedures.

Table 1: Patient demographics

Mean age(years)	61.07(range 45-80)
Male:female	56:0
ASA Grade III	31
ASA Grade IV	25
Gastric perforation	37
Duodenal perforation	18
Ileal perforation	01

Table 2: Outcome profile

Conversion to GA	2(1.12%)
Need for mechanical ventilation	None
Hospital HDU Stay (mean days)	5
Complications	
DVT	None
MI(5th day)	1(0.56%)
Blood transfusion(postop)	5(2.8%)
Pneumonia	2(1.12%)
Other infections	None
Renal failure	None
Respiratory depression	None
Mortality	None

DISCUSSION

Although GA has the benefit of the secured airway and to provide rest to respiratory muscles, however induction of GA and intubation of patients results into dependence on mechanical ventilation. In addition to this, there are mechanical as well as physiological effects of general anaesthesia like bronchospasm, V/Q mismatch, atelectasis, effects on chest impedance, also, use of large tidal volume or excessive PEEP may lead to pneumothorax in these patients and lastly, there may be residual anaesthetic or muscle relaxant effects. Considering these facts and taking account of the lack of modern ventilatory system at some institution, use of GA may increase the risk of perioperative morbidity and mortality.

Although subarachnoid block is not physiologically benign, it offers several advantages^[8]. Upper abdominal surgery has adverse mental effect on functional residual capacity. However, regional anaesthesia attenuates this by improving diaphragmatic function and chest compliance, thus, the normal minute volume is maintained. It also decreases lung congestion by decreasing preload and after load. The benefits seen for neuraxial blockade may be conferred by multifactorial mechanisms, including altered coagulation, improved ability to breath free of pain, and reduction in surgical stress response^[11]. Overall mortality was reduced in patients allocated to neuraxial blockade in a meta-analysis done by Anthony Rodgers *et al*^[8], it also shows reduced odds of deep vein thrombosis, pulmonary embolism, blood transfusion requirement, pneumonia and respiratory depression. Our study also considered the same parameters and confirms same.

CONCLUSION

Although there is a need to conduct more prospective studies to best determine the clinical and surgical criteria for use of spinal anaesthesia as a sole technique, our small observational study indicates the utility of spinal anaesthesia in high-risk, smoker patients posted for upper abdominal surgery and more widespread use of this approach. Skilled anaesthesiologists and surgeons can perform upper GI surgery safely under spinal anaesthesia in a rural set up without modern facilities.

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