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Spinal Anesthesia as an Alternative to General Anesthesia for Emergency Laprotomies in ASA Grade III and IV Patients. An Observational Study at RIMS, Adilabad, Telangana

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Abstract

Background: 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 development of COPD in smokers, as well as 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 higher rate of pulmonary related complications following abdominal surgery.

Non availability of modern ventilatory facilities at these areas is still a major concern as well as challenge to the practicing anesthesiologist in these parts of India. Delayed diagnosis and late referral of abdominal emergencies to the referral canters 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 canters with these facilities. This study reviews the utility of spinal anesthesia in such cases.

Material and methods: We reviewed all cases of abdominal laprotomies conducted during period of June 2008-May 2010. Total 56 cases were selected who were given spinal anesthesia as a sole anesthetic and were chronic smokers with evidence of COPD. 25cases were of ASA grade IV and 31were grade III. All cases were operated for perforation peritonitis. Outcome of these cases was recorded and analyzed.

Results: Intraoperative conditions were adequate with spinal anesthesia 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 postoperative period, 2 patients have developed pneumonia, and mean length of hospital stay was 7 days. There was no report of renal or respiratory insufficiency.

Conclusion: Emergency laprotomies can be safely performed under Spinal anesthesia, making it a safe option and alternative to GA at the centers without modern ventilatory care.

Keywords: ASA; Spinal anesthesia; Emergency laprotomies; Smokers; COPD; Postoperative outcome.

Introduction

Compared to the normal population postoperative complications are 9.5 time 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 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, 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 anesthesia since neuroaxial blockade has minimal respiratory effects even at higher level block [4]. Certain retrospective [5] and prospective [6,7] observational studies in the non-thoracic surgical shows that patients with severe COPD [5] as well as patients not selected for pulmonary pathology [6,7] have better respiratory outcomes when neuroaxial blockade is given rather than GA [8]. Publications over the use of regional anesthesia as a sole anesthetic for upper abdominal surgeries is little, however, prospective randomized studies have been conducted which evaluate the outcome of combined general and regional anesthesia [9,10]. A large matanalysis [8] of prospective randomizes studies showed significant benefit to neuroaxial 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 provide evidence that many upper abdominal surgical procedures thought to require GA may be safely and effectively performed using spinal anesthesia alone. It may be seen that the postoperative course of these patients is incredibly smooth, allowing hospital discharge within several days of procedure.

Materials and Methods

After institute's ethic committees approval records of surgical patients operated for perforation peritonitis from medical record section was 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 score) III and IV, need of GA, need for mechanical ventilation, length of stay, and perioperative complications or mortality. No female patients were identified as per our inclusion criteria.

All the patients received spinal block with 23 G quinckes needle at L3-4 space. Drug used was 0.5% hyperbaric Bupivacaine 4ml. All the patients were infused with 1 liter of NS over period of 2 hrs before spinal administration.

Data was collected and analysed.

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 with American society of Anesthesiologist, 31 of them were ASA grade III and 25 of them were classified as ASA grade IV.

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 1: Patient demographics.

All the patients were optimized preoperatively after initial assessment by anaesthesiologist (dehydration, electrolytes, blood transfusion etc).

None patients had cardio respiratory arrest in perioperative period. Only 1.12% (2) patients needed GA due to prolong surgery, near end of surgery and that were successfully extubated on completion of the procedure. No patient needed mechanical ventilation in 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 procedure and was treated with Streptokinase and was discharged after 15 day. 5(2.8%) patients were found to be anemic and received blood transfusion on 3rd postoperative day.

Two (1.12%) of the patients with history of recent respiratory tract infections have developed Pneumonia on 3rd day and were treated with higher antibiotics and discharged after 2weeks. None of the patients have found to developed deep vein thrombosis, respiratory depression or renal failure. Overall mortality was zero (Table 2).

Outcomes	
Conversion to GA	2(1.12%)
Need for mechanical ventilation	None
Hospital HDU Stay mean	5 days
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

Table 2: Outcomes and Complications.

Spinal block level attended was up to T4-T5 level, Intraoperative relaxation was adequate for successful completion of procedures.

Follow up was noted as per records till the time of discharge.

Discussion

Although GA has the benefit of secured airway and to provide rest to respiratory muscles, however induction of GA and intubation of patients results in to dependence on mechanical ventilation. In addition to this there are mechanical as well as physiological effects of general anesthesia like bronchospasm, V/Q mismatch, atelectesis, 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 anesthetic 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 risk of perioperative morbity and mortality. Although there is availability of the ventilators at institution like this there are certain other obstacles to use them such as nonavailabity of expert staff, central oxygen supply etc.

Although subarachnoid block is not physiologically benign, it offers several advantages [8]. Upper abdominal surgery has detrimental effect on functional residual capacity. However, regional anesthesia attenuates this by improving diaphragmatic function and chest complaince, thus, normal minute volume is maintained. It also decreases lung congestion by decreasing preload and afterload. The benefits seen for neuroaxial blockade may be conferred by

multifactorial mechanisms, including altered coagulation, improved ability to breathe free of pain, and reduction in surgical stress response [11].

Overall mortality was reduced in patients allocated to neuroaxial blockade in a metanalysis 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 anesthesia as a sole technique, our small observational study indicates the utility of spinal anesthesia in high risk, smoker patients posted for upper abdominal surgery and more widespread use of this approach.

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