



"RETROSPECTIVE STUDY OF MANAGEMENT OF HIGH RISK PATIENTS FOR LAPARATOMY UNDER SPINAL ANESTHESIA IN RURAL AREA HOSPITAL"

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ABSTRACT

Anesthesia for laparotomy is very challenging. If patients associated with some other comorbidities, then it is more challenging situation for anesthetists, particularly those who are working at rural area & only single anesthetist.

Choice of anesthesia & anesthetic agent is judicious & must be balanced to maintain all parameters within normal condition. Spinal anesthesia (S/A) for laparotomy as an alternative to general anesthesia (G/A) in high risk patients is very much useful. Prevalence of smoking, alcohol consumption, tobacco chewer & opium addiction is very high in our district (Banaskantha). Common complications due to this habits may lead to COPD, gastric ulcers, chronic opium addict patients may have damaged heart, lungs, liver & brain. It is very common that smoker & patients with COPD have higher risk of pulmonary complications after abdominal surgeries. Spinal anesthesia has been proposed as a means to reduce postoperative complications in both adults & paediatric patients. Nonavailability of modern full working ventilatory facility & I.C.U. at these areas is still a major concern as well as challenge to the practicing anesthesiologists in these parts of India. In this developing world we anesthesiologists who practicing in remote place hospital, has to suffer a lot in practice because of lack of materials, lack of skilled manpower, inadequate machinery, single handed work, shortage of associated staff. Delayed diagnosis & late referral of abdominal emergencies to the district centres make it more difficult to manage & provide optimal care, however, due to poor financial status, critical conditions & no willingness to go to higher centre, it is never been easy to refuse the patients to tertiary centers with these facilities. This study review the utility of spinal anesthesia in such a patients.

We reviewed 170 cases of laparotomy for different abdominal conditions like peptic perforation, intestinal obstruction, perforation peritonitis, huge ovarian cyst, large abdominal mass, obstructed inguinal hernia, stab injury abdomen & blunt injury abdomen with hemo peritoneum. Total 170 cases done under spinal anesthesia (S/A) as a sole anesthetic. All the patients from ASA grade III & IV. Outcome of these cases was analyzed. Intraoperative condition were good with S/A for successful completion of the laparotomy in all the cases. Only 8 Patients who required supplementation with G/A due to prolonged surgical time or inadequate level of anesthesia block. None of the patients required ventilatory support, ICU admission In postoperative period, as we don't have proper recovery room facility for these type of patients. No single mortality was reported. These was no any renal & respiratory insufficiency noted. Hospital stay of all the patients was about 5 to 10 days. Laparotomy safely done under S/A. So S/A for laparotomy is very safe option & good alternative to G/A at the centres without modern ventilatory care unit. S/A could be well indicated in patients having respiratory disease, difficult airway, malignant hyperthermia, single anesthetist, nonavailability of ventilatory support facilities. S/A would be fundamentally very useful in both adult & pediatric patients. Patients with allergic reaction to local anesthetist, local infection, coagulopathy, intracranial hemorrhage were excluded from S/A.

KEYWORDS : Laparotomy, spinal anesthesia, COPD, ASA grade, rural area.

INTRODUCTION:

Laparotomy is a common surgical procedure with very high mortality & morbidity. This study reviews the management of patients presenting for elective / emergency laparotomy. This procedure is very well known to each & every anesthetist, however, the common factor of a surgeon opening an abdomen to manage intra abdominal condition may have multiple causes. With comparison of normal person, there are more postoperative complications in patients with other associated preexisting diseases, most common is respiratory disease. Postoperative respiratory complications are very high among the patients who undergo upper abdominal surgeries. Patients presenting for laparotomy, have associated deranged body homeostasis & gut function, increase risk of sepsis, they are effectively experiencing a complication before surgery. Due to non availability of modern ventilatory care & proper ICU care, mortality rate is very high in immediate postoperative period. Mortality is high with G/A (already compromised lungs affect respiratory function & lead to dependence on artificial ventilation). S/A may be very attractive, effective & safe alternate to G/A for such a patients, because neuraxial blockade has very less respiratory effects even as higher level block. Publication over the use of R/A as a sole anesthetic technique for upper abdominal surgeries is little, however, studies have been conducted which evaluate the outcome of combined G/A & R/A. Superior postoperative pain control is provided by the S/A technique. Our study provide that upper abdominal surgical procedures may be safely & satisfactorily performed & managed by using S/A alone, only 8 patients excluded who require supplementation with G/A. (due to prolonged surgical time or inadequate level of block). It was observed that the postoperative course of these all patients is incredibly smooth & satisfactorily (for

all - surgeon, patient & anesthetist) allowing hospital discharge within 5-10 days of operation.

MATERIAL & METHODS:

After hospital authority's approval, records of surgical patients, operated for laparotomy from medical record section was reviewed. Various diagnosis include, peptic perforation (34 Pts.) Obstructed inguinal hernia (4 Pts.), Intestinal obstruction (37 Pts.), perforated peritonitis (61 Pts.), abdominal mass (6 Pts.), Huge ovarian cyst (8 Pts.), stab injury abdomen (11 Pts.), blunt injury abdomen (9 Pts.) Patients were of ASA grade III (103 Pts.) & of ASA grade IV (67 Pts.). Age of the patients varies from 10 yrs. to 70 yrs. Study of 170 patients done. Out of this 118 Pts. were males & 52 patients were females. Evidence of other associated comorbidity like COPD, asthma, hypertension, sepsis, pulmonary kochs, anemia, smoker, alcoholic, tobacco chewer, and opium addiction was reviewed. Records were reviewed to determine age of patients, diagnosis, indication of surgery, type of surgery performed, American society of anesthesiology (ASA) classification, type of anesthesia, preoperative, intraoperative & postoperative management, complications, morbidity & mortality. Data was collected & analyzed. Patients with abdominal pathology & abdominal trauma may present to hospital mostly via emergency department, as patient referred to a surgical assessment unit. In all the patients bedside observation was done following admission or in the case of indoor patients, at the time of any clinical deterioration. Observation of respiratory ratio, oxygen saturation, temperature, blood pressure, heart rate, level of consciousness of all the patients was done to identify sick, high risk patients & to escalate the patient's care appropriately from the outset. Thorough history, H/o associated comorbidity was taken. All the patients examined properly & carried out investigations, ideally within an hour of arrival. In emergency

laparotomy, depending on availability of investigations should done include: full blood count, renal function test, serum electrolytes, liver function test serum amylase, blood glucose, coagulation profile, blood group, urinalysis, ECG. Some form of preoperative imaging include ultrasound, an erect x-ray chest, abdominal x-ray or an abdominal CT when necessary. This would help to clarify the extent & urgency of operation. The use of an objective risk assessment tool prior to surgery was recommended. Importantly, it also enables the expected risk of death to be communicated to patients & their families, enabling a more informed decision to consent & provides a more realistic understanding of the severity of the patient's situation. In all the patients, informed written consent was taken for high risk according to patient's current physiological derangement, in a vernacular language, so patient & relative can easily understand the risk & general condition of patients. So all the patients were optimized preoperatively after initial assessment by anesthetist (dehydration, electrolytes, blood transfusion etc.) Some patients have sepsis, that characterized by tachycardia, hypotension, tachypnoea, derangement in body temperature, low urine output, reduced cognitive function, along with raised inflammatory markers. The end result is impaired oxygen delivery to the patient's organ & organ failure. Treatment of cause is ideal. 3 important aspects for treatment of the source of sepsis: antibiotics administration, hemodynamic resuscitation, source control by surgical intervention. Immediate treatment was consist of administration of oxygen by ventimask, securing good intravenous access & blood culture, if needed. Fluid resuscitation is vital in maintaining hemodynamic performance & oxygen delivery to the tissues. Blood transfusion was given in all anemic patients to increase oxygen carrying capacity & improve oxygen delivery. Urinary catheterization & nasogastric tube was inserted routinely in all the patients. In addition, any patient with a predicted mortality risk should receive active input from both consultant surgeon & consultant anesthesiologist.

RESULT:

In our study, non of the patient had cardio respiratory arrest in intraoperative & postoperative period. Out of 170, only 8 (4.7%) patients needed supplementation with G/A (because of prolonged surgical duration or inadequate level of block). No. of patients who needed mechanical ventilation in postoperative period was zero. Length of postoperative stay was about 5-10 days. About 49 patients found anemic & received, blood transfusion intraoperatively or postoperatively. Majority of the patients received O₂ inhalation by ventimask during intraoperative & postoperative period. None of the patients had found to develop deep vein thrombosis, respiratory depression or renal failure. Mortality was zero. Spinal anesthesia was given with Inj. Anawin (Bupivacaine) heavy 0.5% or Inj. Lox (Lignocaine) heavy 5% with adrenaline rinse. Spinal needle of no. 25, 23 & 22 was used. Spinal block level attended was upto T4-T5 level. Intraoperative relaxation was adequate for successful completion of surgery & for surgeon's satisfaction.

Table: 1 :Ageratio of study.

Age	10-20 yrs.	21-30 yrs.	31-40 yrs.	41-50 yrs.	51-60 yrs.	61-70 yrs.	Total
No. of Pts.	40	41	37	22	21	9	170

Out of 170 cases, 118 patients were males & 52 were female. 156 surgeries were emergency laparotomy, while 14 were elective. Elective laparotomy include abdominal mass, huge ovarian cyst, pseudo pancreatic cyst.

Table: 2 :Demographic presentation of patients.

Demographics of patients	
Mean age (years)	34.6 (range 10 - 70)
Male patients	118 (69.42 %)
Female patients	52 (30.58 %)
Elective laparotomy patients	14 (8.24 %)
Emergency Laparotomy patients	156 (91.76 %)
ASA Grade III	103 (60.58 %)
ASA Grade IV	67 (39.42 %)

Table: 3 : Various diagnosis in patients who underwent laparotomy surgery.

Diagnosis of patient	No. of patients
Intestinal obstruction	37 (21.76 %)
Perforation peritonitis (appendicular, enteric)	61 (35.88 %)
Abdominal mass (liposarcoma, pseudopancreatic cyst)	6 (3.53 %)
Huge ovarian cyst / mass.	8 (4.70 %)
stab injury abdomen	11 (6.47 %)
Blunt injury abdomen (Hemperitoneum)	9 (5.29 %)
Peptic Perforation	34 (20 %)
Obstructed inguinal hernia	4 (2.35 %)
Total	170

Out of the 170 patients for laparotomy, 37 patients having intestinal obstruction, 61 patients having perforation peritonitis, 6 patients having abdominal mass, 8 patients having huge ovarian mass / cyst, 11 patients having stab injury abdomen, 9 patients having blunt injury abdomen, 34 patients having peptic perforation & 4 patients having obstructed inguinal hernia reported. All the patients were optimized preoperatively after initial assessment by anesthesiologist (dehydration, electrolyte, blood transfusion, sepsis etc.)

Table: 4 :Outcome of surgery under S/A.

Supplemented with G/A	8 (4.70 %) patients
Required mechanical ventilation	None
Hospital stay	5-10 day

Table: 5 :Complications

Complications	No. of patients
Septic shock (hypotension)	14 (8.23 %)
Deep vein thrombosis (DVT)	None
Myocardial infarction (MI)	None
Blood transfusion (intraoperative or Postoperative)	49 (28.82 %)
Pneumonia	None
Renal failure	None
Respiratory depression	None
Other infections (wound infection)	3 (1.76 %)
Mortality	None
Postoperative ICU care required	None
High spinal block incidence	None
Postdural puncture headache (PDPH)	6 (3.52 %)

Post dural puncture headache (PDPH) was noted in 6 patients. It was moderate & lasts for few days & was relieved by rest & minor analgesics. None of this 6 patients having PDPH, required aggressive treatment for PDPH. 14 patients having septic shock & subsequent hypotension (due to septic shock patients who remain hypotensive even after adequate volume expansion). It was treated with vasopressor Dopamine injection. Some patients become stable with 1-5 mcg / kg / min i.v. dose of Dopamine injection, which increases urine output & renal blood flow, while some with 20-50 mcg / kg / min i.v. dose of dopamine to increase blood pressure. There was no any incidence of high spinal block noted. Wound infection occurs in only 3 (1.76 %) patients & which was treated by only local dressings. There were 49 anemic patients. Who received blood transfusion intraoperatively or postoperatively.

DISCUSSION:

Although, spinal anesthesia is not physiologically benign, it offers several advantages over G/A, where there is no facility of modern ICU & ventilatory support system. Also use of G/A increases risk of intraoperative & postoperative morbidity & mortality. Upper abdominal surgery has disadvantageous effect on functional residual capacity of lung. However, S/A attenuates this by improving diaphragmatic functions & chest compliance, thus normal minute volume is maintained properly. It also decreases pulmonary congestion by decreasing preload & afterload. Study shows no mortality. It also shows no incidence of DVT, pulmonary embolism, pneumonia, respiratory depression, myocardial infarction, renal failure, high spinal block, postoperative ventilation & ICU care.

CONCLUSION:

patients who undergoing emergency laparotomy, they are at high risk of adverse outcomes. Spinal anesthesia is very safe & satisfactory in this type of surgical procedures. Rapid postoperative recovery & no need of mechanical ventilation, are most beneficial with S/A, for surgeons as well as anesthetist. S/A is also cost effective as compared to G/A, which is important factor in rural area hospital, to get good outcome with less cost. Also S/A very safe in patients with associated comorbidity, as with G/A, there is a risk of postoperative mechanical ventilation requirement. Although there is a need to conduct more prospective studies to best determine the clinical & surgical criteria for the use of S/A as a sole technique in laparotomy patients. Our small observational study shows the utility of S/A in high risk, smokers, patients posted for upper abdominal surgery & more widespread use of this approach. In our study, both, operating surgeon as well as anesthetist were very happy & satisfied with patients management & outcome. Even patients were also satisfied with S/A.

REFERENCES:

- 1) Savas J, Litwack R. Regional anesthesia as an alternative to general anesthesia for abdominal surgery in patients with severe pulmonary impairment. *The American Journal of Surgery*. 2004; 188(5):603-605.
- 2) Mallon JS, Edelist G. Risk factors of importance-the patient. *Probl Anesth*. 1992; 6:193-204.
- 3) Brocks-Brunn JA. Predictors of pulmonary complications following abdominal surgery. *Chest*. 1997; 111:564-571
- 4) Askrog VF, Smith TC, Ekeenhoff JE. Changes in pulmonary ventilation during spinal anesthesia. *Surg Gynecol Obstet*, 1964; 119:563
- 5) Tarhan S, Moffit EA, Sessler AD. Risk of anesthesia and surgery in patients with chronic bronchitis and obstructive pulmonary disease. *Surgery*. 1973; 74(5):720-6
- 6) Mitchell CK, Smoger SH, Pfeifer MP. Multivariate analysis of factors associated with postoperative pulmonary complications following elective surgery. *Arch Surg*. 1998; 133(2):194-198
- 7) Arozullah AM, Khuri SF, Henderson WG, Daley J Development and validation of a multi factorial risk index for predicting postoperative pneumonia after major noncardiac surgery. *Ann Intern Med*. 2001; 135(10):847-857
- 8) Anthony R, Walker N. Reduction of postoperative mortality and morbidity with epidural or spinal anesthesia: results from overview of randomized trials. *BMJ*. 2000; 321(7275):14993-1497
- 9) Woo YP, Thompson JS, Lee KK. Effect of epidural anesthesia and analgesia on perioperative and postoperative outcome: a randomized, controlled Veterans Affairs Cooperative study. *Ann Surg*. 2001; 234(4):560-571
- 10) Rigg JR, Jamrozik K. Epidural anesthesia and analgesia and outcome of major surgery: a randomized trial. *Lancet*. 2002; 359(9314):1276-1282.
- 11) Kehlet H. Modification of responses to surgical and neural blockade: Clinical implications. In: *Neural Blockade in Clinical Anesthesia and Management of Pain*, (2nd ed), Cousins MJ, Bridenbaugh PO (eds.). Philadelphia JB Lippincott. 1988, 145