



JUSTIFYING THE ROLE OF SPINAL ANESTHESIA IN HIGH RISK CASES POSTED FOR EMERGENCY LAPAROTOMIES : AN OBSERVATIONAL STUDY IN DR. SUSHEELA TIWARI HOSPITAL, HALDWANI.

General Surgery

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ABSTRACT

Introduction: Perforation peritonitis is a very common life threatening surgical emergency encountered by the general surgery department of most medical colleges. The common gastro intestinal tract perforations seen are peptic ulcer perforations, ileal perforations secondary to enteric fever and abdominal tuberculosis and appendicular perforations. Gastro duodenal perforations secondary to perforated peptic ulcer disease is common in Kumaun hilly area belt due to excessive smoking and drinking habits of people residing in the hilly areas as well as stress of life as a part of difficulties encountered in hilly areas. Most of the patients have co-morbidities like COPD and bronchial asthma and hence have higher post operative respiratory complications after general anaesthesia(GA). It is a difficult situation for both the surgeons and anesthetists to successfully manage such cases as there is an increased mortality due to general anaesthesia related complications also in addition to the surgical pathology despite of satisfactory surgical closure of the perforation site. The study justifies the role of spinal anesthesia in such cases. **Materials And Method:** We reviewed hundred cases of emergency laparotomies done between Jan 2021 and June 2023 in Dr. Susheela Tiwari hospital, Haldwani who were given spinal anesthesia as a sole anesthetic agent out of which seventy cases were ASA IV and thirty cases were ASA III. Outcome in all the cases was analyzed and recorded. **Results:** All the cases were successfully operated and ninety five cases survived. 5 cases died in post operative period and 5 cases required conversion to GA due to lengthened surgery. One of the cases needed mechanical ventilatory support post operatively. 2 patients had post-operative MI and 1 each had respiratory failure, acute renal failure and pulmonary embolism respectively. Mean hospital stay was eight days. **Conclusion:** This study suggests that spinal anaesthesia is a reasonable option and a good alternative to GA in such high risk surgical cases who are otherwise deemed unfit for general anaesthesia. Spinal anesthesia decreases the need for post-operative ventilatory support and hence decreases complications and mortality due to ventilatory support related hazards.

KEYWORDS

INTRODUCTION:-

Perforation peritonitis is a very common life threatening surgical emergency encountered by the general surgery department of most medical colleges. The common gastro intestinal tract perforations seen are peptic ulcer perforations, ileal perforations secondary to enteric fever and abdominal tuberculosis and appendicular perforations. Gastro duodenal perforations secondary to perforated peptic ulcer disease is common in Kumaun hilly area belt due to excessive smoking and drinking habits of people residing in the hilly areas as well as increased stress of life as a part of difficulties encountered in hilly areas. Most of the patients have co-morbidities like COPD and bronchial asthma and hence have higher post operative respiratory complications after general anaesthesia(GA). Preoperative anaesthetic checkup(PAC), prompt initial resuscitation and optimization and most appropriate customized anesthesia technique for a particular case decides the fate of the surgical outcome. Regional anesthesia was first advocated for emergency operations back in 1930[1]. Compared to normal population post op complications are 9.5 times more frequent in patients with pre-existing pulmonary diseases[2]. Patients with COPD have shown 5-13 times higher mortality risks[3]. Upper abdominal surgical procedures enhance post op pulmonary complications under G.A due to reduced functional pulmonary residual capacity in early post op period[4]. There are high mortality rates due to effects of G.A and intubation with improper mechanical ventilation of already compromised lungs, as well as excessive use of long acting opioids for severe pain control which may further effect the pulmonary functions and leads to dependency on mechanical ventilation besides its effects such as bronchospasm, V/Q mismatch, atelectasis, and residual anesthetic or muscle relaxant effects[5]. Spinal anesthesia(SA) may be a valid option and safer alternative to G.A in such cases as neuroaxial blockade has minimal respiratory effects even at higher levels. Besides certain retrospective[6] and prospective[7] observational studies have also shown that patients with COPD have better outcome under spinal anesthesia. Utilization of spinal anesthesia for emergency abdominal surgery has been reported with benefits for high risk cases having uncontrolled hyperthyroidism and severe myasthenia gravis [7,8].

Collins et al have reported the advantages of S.A with no risk of intubation related airway complications, minimal risk of unrecognized

hyperglycemia in a diabetic patient, excellent muscle relaxation, decreased surgical bed oozing and rapid return of bowel functions[9,10,11]. Spinal anesthesia does not require the aerosol generating procedure thus minimizing the transmission risk of airborne infections rendering it safe in mildly symptomatic covid 19 patients as reported by SALie et al[12,13].

MATERIALS AND METHOD:-

This is a retrospective observational study where we reviewed hundred cases of emergency laparotomies done between Jan 2021 and June 2023 in Dr. Susheela Tiwari Hospital, Haldwani who were given spinal anesthesia as a sole anesthetic agent. The anesthetic drug used in our hospital was bupivacaine at L2, L3 level. Additional drugs nalbuphene, aminophylline and hydrocortisone were required in 20 patients. All the laparotomies were performed with a full midline incision. Seventy cases were ASA IV and thirty were ASA III respectively. The cases selected for the study were adults with evidence of COPD and co-morbidities. Records of all the patients were reviewed to determine the gender, age, diagnosis, indication of surgery, type of surgery performed, ASA classification, need for ventilator support, need of G.A, length of hospital stay and perioperative complications. Data was collected and analyzed.

OBSERVATIONS AND RESULTS:-

Average age of patient was 65 years. Fifty five patients were operated for duodenal perforations, twenty five for gastric perforations, twelve patients had ileal perforations and eight patients had general peritonitis secondary to appendicular perforations [TABLE 1]. Almost all of our patients had co-morbidities most common being COPD (62%), hypertension (40%) and Diabetes Mellitus II(25%). 15% of the patients had pulmonary tuberculosis under treatment, multiple co-morbidities were seen in 16% cases and two of our cases showed kyphoscoliosis with restrictive lung disease[Table 2]. Seventy patients were ASA IV and thirty were ASA III.

All the patients had been optimized pre-operatively, no cardio respiratory complications were observed. Ninety five cases survived in post-operative period and five patients succumbed to death. Only five patients needed intra operative conversion to G.A due to prolonged surgery and were successfully extubated. One of our patients needed

mechanical ventilation in post-op period. Fifteen patients needed ionotropic support. Nausea and vomiting were recorded in 38 patients and was treated with ondansetron 4mg. Bradycardia was noted in 25 patients and treated with atropine 0.5 mg. 5% of our patients needed blood transfusion because of anemia. Two of our patients had myocardial infarction (MI) and they succumbed to death. Five patients in our study developed basal pneumonitis and were treated with higher antibiotics and discharged after 10 days. One of our patients developed deep vein thrombosis and pulmonary embolism, one developed respiratory failure requiring mechanical ventilation and one developed acute renal failure. All these 3 patients died. Overall mortality rate seen was 5% [TABLE 3].

Table 1:- Patient demographics

Male patients	60(N)
Female patients	40(N)
Mean age (years)	65 years
ASA grade 3	30
ASA grade 4	70
Duodenal perforation	55
Gastric perforation	25
Ileal Perforation	12 (08- tubercular, 04-typhoid)
General peritonitis	08(gangrenous appendicitis with basal perforation)

Table 2 :- Patient variables

Variable	N	(%)
Comorbidity		
Hypertension	40	40
DM type2	25	25
Pulmonary Koch's under treatment	15	15
COPD	62	62
Multiple comorbidities	16	16
Kyphoscoliosis (dorsal spine with restrictive lung disease)	02	2
Intervertebral level		
L1-L2	70	70
L3-L4	30	30

Table 3 :- Case outcome

Nausea and vomiting	38(38%)
Bradycardia	25 (25%)
Ionotropic support	15 (15%)
Blood transfusion requirement	05 (5%)
Conversion to G.A.	05(5 %)
Need for mechanical ventilation	01(1%)
Hospital stay(mean)	08 days
Complication	
M.I.	02 (2%)
Basal pneumonitis	05(5%)
DVT & Pulmonary embolism	01(1%)
Renal failure	01(1%)
Respiratory depression	01(1%)
Mortality	05(5%)

DISCUSSION:-

Our study suggests that spinal anesthesia is a safe and cost effective alternative to general anesthesia for emergency laparotomies in high risk cases. Though not being physiologically benign, spinal anesthesia offers significant advantages of improved diaphragmatic function and chest compliance thus maintaining normal minute volume. It also decreases lung congestion by decreasing preload and afterload. Mortality and serious complications such as DVT, pulmonary embolism, myocardial infarction, transfusion requirement, pneumonias, aerosol generating risks to staff, respiratory depression and renal failure are reduced in cases done under spinal anesthesia.

The benefits of neuroaxial blockade are conferred by multifactorial mechanisms like altered coagulation, painless breathing and reduction in surgical stress response[14]. Risks of pulmonary aspiration in cases of intraoperative vomiting is reduced by intact airway reflexes. Safety and effectiveness of S.A in emergency laparotomies in our study has stronger evidence in favour of its use. Adequate intraoperative analgesia and surgical relaxation is maintained to the satisfaction of surgeon. Invasive airway management and multiple drugs involved in

G.A is reduced as well as potential post-op mechanical ventilation and prolonged level 2 and level 3 care required usually in such cases is almost nullified. Considering this and the fact that hard pressed/ lack of ventilatory support at some institutions may be taken care of by using spinal anesthesia for all cases of high risk emergency laparotomies.

CONCLUSION:-

Emergency laparotomies done for perforation peritonitis are associated with high risk of intra operative and post operative complications including mortalities especially in high risk patients with COPD and other co-morbidities rendering them into higher ASA grades(III & IV). Usage of SA in such situations are found to be very beneficial and life saving in patients as demonstrated in our study. SA is an extremely cost effective measure in comparison to GA and it is extremely relevant in context of a resource limited, high population and high financial burden country like India. The additional financial burden and added complication rates of post-operative ICU and mechanical ventilation requirement after GA may also be omitted by the selective and judicious use of SA in such difficult situations. Based on our observations we strongly recommend S.A as a suitable alternative to G.A in emergency laparotomies in such tricky situations of high risk co-morbid patients.

After facing the wrath of the pandemic of Covid-19 scenario, spinal anesthesia has emerged as a highly safe anesthetic modality of choice for undertaking emergency life saving surgeries by virtue of its minimal aerosol generation, thereby protecting the vulnerable healthcare personnel from any suspected sources further justifying the usage of S.A as a suitable alternative to G.A in emergency laparotomies.

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