



POST-OPERATIVE PULMONARY COMPLICATIONS IN CASES OF EMERGENCY EXPLORATORY LAPAROTOMY

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ABSTRACT

The frequency of post-operative pulmonary complications (PPCs) after emergency laparotomies are incompletely understood. These are associated with increased morbidity and mortality, thereby leading to poorer outcomes. PPCs combine infectious causes like pneumonia, respiratory failure, along with acute exacerbations of pulmonary diseases. The commonest cause for development of PPCs is the length of the incision taken at time of surgery and the time lag between patient mobilization and extubation.

KEYWORDS : PPC, Emergency, Laparotomy, Pneumonia

INTRODUCTION-

The incidence of post-operative pulmonary complications (PPC) in patients undergoing abdominal surgery is variable owing to the presence of different risk factors. It is reported to range from 5 to 30% (1,2). Type of operation, type and duration of anaesthesia, age, pulmonary disease and smoking have been identified as main predictors of PPC.

PPCs are the leading cause of postoperative morbidity and mortality and increase hospital length of stay, medical consumption, and hence costs.

To counter the complications many interventions such as deep breathing exercises (DBE), incentive spirometry (IS) and early ambulation have been considered, though the results of studies incorporating such techniques have been conflicting. In the present medical scenario, there is a need for a uniform criteria for establishing the presence of pulmonary complications and for describing postoperative therapeutic regimens.

The objective of the present study was to elucidate the incidence of, risk factors for, and preventive measures for PPCs after emergency laparotomy.

AIMS & OBJECTIVES-

1. To determine incidence of PPC following emergency laparotomy
2. To determine methods to reduce the complications

MATERIAL & METHODS-

A prospective hospital based study carried out over a period of 1yr (June 2018-June 2019) including 50 patients who underwent emergency exploratory laparotomy for various reasons. All patients were given general anaesthesia.

Duration of the hospital stay and of the post-operative hospital stay were recorded.

All patients were followed up in the surgical ward.

Post-extubation, patients were ambulated within 24hours and chest physiotherapy, along with incentive spirometry was started within 12hrs.

A daily assessment of the respiratory conditions was made until discharge according to a standardized protocol, which included clinical examination and oxy-haemoglobin saturation monitoring by a pulse oximeter.

Pneumonia, pneumothorax and pleural effusion were diagnosed on a clinical and radiological basis.

Respiratory failure was considered in the presence of abnormalities of pulmonary gas exchanges as reflected by an increase higher than 4 kPa of PA-aO₂ associated with a persistent decrease, longer than 2 days, in oxyhaemoglobin saturation lower than 90% on room air.

Assisted ventilation via an endotracheal tube and monitoring in a high dependency area were needed when respiratory failure was not relieved by oxygen and medical therapy.

RESULTS-

Of the 50 patients, 28 (56%) were male and 22 (34%) were female. Mean age was 42 +/- 2.5 years.

Table 1 shows the frequency of complications in each age-group.

AGE GROUP (in years)	NUMBER OF PATIENTS	FREQUENCY OF COMPLICATIONS
20-30	6	1
31-40	14	8
41-50	14	7
51-60	10	7
61-70	6	4

Table 2 shows the various diagnosis at exploration and number of patients with PPC

DIAGNOSIS AT SURGERY	FREQUENCY	FREQUENCY OF PATIENTS WITH PPC
Hollow viscus perforation	29	16
Bowel obstruction	15	8
Solid organ injury	1	-
Mesenteric ischemia	1	1
Volvulus	4	3

Table 3 shows Type of PPC and frequency

PULMONARY COMPLICATIONS	FREQUENCY	NOTES
Basal atelectasis	10	1. Most common 2. 48-72hrs post extubation
Pneumonia	2	-
Pleural effusion	8	Therapeutic tap, if symptomatic

Ventilator associated pneumonia	4	1. Old age 2. Three patients of volvulus 3. One patient of pre-pyloric perforation
Acute respiratory distress syndrome	2	1. Re-intubated 2. Succumbed

DISCUSSION-

We found an overall incidence of 53% PPC. Upper abdominal incisions, old age, pre-existing cardiac or respiratory illnesses were independent risk factors for development of PPCs. Smetana et al. [3] reviewed the literature on frequency and risk factors for PPCs after non cardiothoracic surgery spanning the years 1980–2005. Nine papers focused on laparotomies [5, 6, 7, 8, 9, 10, 11, 12, 13], and PPCs ranged from 0.9 to 69.5%. A prospective cohort study published in 1997 not included in the review of Smetana et al. [3] included 400 patients and reported a PPC frequency of 22.5% [4]

Laparotomy reduces diaphragmatic function via reflex inhibition of phrenic nerve output, during the first postoperative week [14]. Atelectasis and pneumonia are promoted by rapid-shallow breathing due to the impairment of diaphragmatic function.

The primary aim of respiratory exercises is to increase expiratory lung volume, particularly functional residual capacity. Hence patients are asked to inflate their lungs maximally to sustain that inflation. This is achieved with incentive spirometry- which has shown significant results in reduction of PPC. There are many studies, like those by Thorren et al, Morran et al, and Warren, have all shown a PPC rate of 12% , 27%, 12% in patients who were given post-operative chest physiotherapy, which is less than half, when compared with the patients who were not given chest physiotherapy following abdominal surgery. Whether incentive spirometry or chest physiotherapy is better to prevent PPC- is a topic for discussion.

CONCLUSION-

Post-operative pulmonary complications are common following emergency laparotomies, its incidence can be reduced by chest physiotherapy, incentive spirometry.

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