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Original Research Article

Incidence of post-operative pulmonary complications following emergency laparotomy in tertiary care centre in Vindhya region of Madhya Pradesh, India

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ABSTRACT

Background: Pulmonary complications after abdominal surgery, including pneumonia, atelectasis and respiratory failure, are significant cause for patient suffering, prolonged hospital stays and increased mortality rate. There are well documented cases of atelectasis, pneumonia, aspiration pneumonitis, Acute respiratory distress syndrome, pleural effusion, empyema, tracheobronchitis etc. Present study aims at studying the incidence of pulmonary complications following emergency laparotomy.
Methods: A total of 271 patients who got admitted through SOPD, casualty or transferred from other departments and underwent emergency laparotomy during the period of study were included in the study irrespective of the age and sex. Post operatively patients were regularly monitored and with advent of clinical and investigative findings post-operative pulmonary complications were recorded and incidence was calculated.
Results: The mean age of the patients in present study was 36.1 and standard deviation of 15. Out of 271 patients, 219 were males 52 were females. Most common etiology of peritonitis was Peptic perforation (35.4%) followed by ileal perforation (23.6%). Incidence of post-operative pulmonary complications in present study was 30.2%.
Conclusions: Post-operative pulmonary complications continue to be a significant morbidity following emergency laparotomies. Preoperative risk factors include smoking history, pre-existing lung disease and cardiac dysfunction. Emergency nature of the procedure, long duration operation and midline incision are the other factors that can increase the risk of PPC. Early identification and aggressive treatment goes a long way to tide over the progress to a life-threatening state.

Keywords: Emergency laparotomy, Incidence, Pulmonary compactions

INTRODUCTION

Pulmonary complications after abdominal surgery, including pneumonia, atelectasis and respiratory failure, are significant cause for patient suffering, prolonged hospital stay and increased mortality rate.[1-3] Although postoperative pulmonary complications (PPC) are recognized to be common, reported incidence is variable, ranging from 9% to 40%, probably due to methodological discrepancies among various studies.[4,5] A number of risk factors for PPC following elective nonthoracic surgery, derived from clinical history, physical examination, lung function tests, chest X-ray and other pre or intra-operative elements, has been described.[6]

However, studies on incidence and predictors of pulmonary complications after emergency surgery are very scarce. Emergency surgery has been reported to

carry higher morbidity and mortality rates than elective procedures.[7,8] The emergency nature of the procedure has also been independently associated with higher rates of postoperative pneumonia and respiratory failure.[9,10]

Considering that demographic and clinical characteristics of patients as well as preoperative diagnoses and surgical strategies adopted in emergency situations are expected to be quite diverse from those in elective surgery, we hypothesized that a different set of predictors for PPC should also be in place. The aim of this study was to determine the incidence of and risk factors for PPC in patients submitted to emergency abdominal surgery.

METHODS

The present study was carried out in 271 patients in the Department of Surgery, Shyam Shah Medical College and associated G.M. and S.G.M. Hospitals, Rewa (Madhya Pradesh) during the period of 1st August 2015 to 31st July 2016. Patients were admitted in surgical wards through OPD, casualty or admitted in other wards and then transferred to surgery.

Patients were interrogated in detail regarding their particulars, presenting complaints, past history, treatment received, any previous surgery done etc. Patients were resuscitated by IV fluid, antibiotic and supportive treatments. Diagnostic investigations like X-ray abdomen, USG abdomen were done; other essential investigations like hemoglobin, TLC, DLC, blood sugar, LFT, blood urea, serum creatinine etc. were done.

Patients were given antibiotic and supportive treatment. Patients who were fit for surgery, exploratory laparotomy was done. Patients were regularly monitored, and post-operative pulmonary complications were recorded based on serial X-rays, Leukocytes count etc. and clinical findings. Patients were treated accordingly. Patients were discharged with advice to attend SOPD for follow up.

RESULTS

The mean age of the patients in present study was 36.1 and standard deviation of 15 (Table 1).

Table 1: Distribution of cases according to age.

Age group (years)	Total no. of cases
0 to10	19
11 to 20	36
21 to 30	65
31 to 40	52
41 to 50	44
51 to 60	29
61 to70	15
>70	11
Total	271

Out of 271 patients, 219 were males 52 were females (Figure 1).

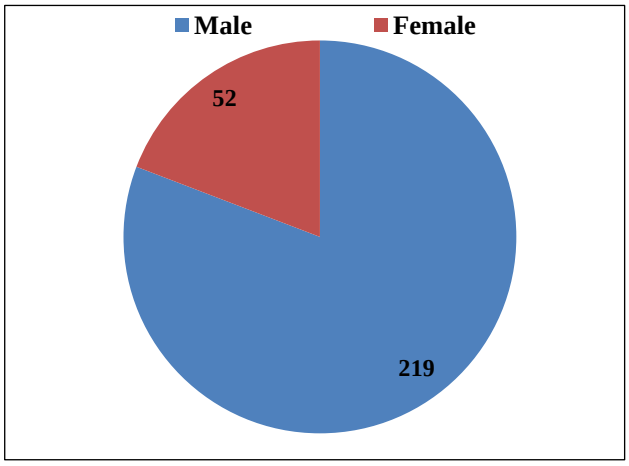

Figure 1: Distribution of cases according to sex.

Most common etiology of peritonitis was Peptic perforation (35.4%) followed by ileal perforation (23.6%) (Table 2).

Table 2: Distribution of patients according to diagnosis.

Diagnosis	No of patients
Peptic perforation peritonitis	96
Ileal perforation peritonitis	64
Trauma	22
Pyoperitoneum	5
Abdominal tuberculosis	12
Appendicular perforation	10
SAIO	36
Post-operative adhesions	10
Miscellaneous	16
Total	271

Overall incidence of post-operative complications was 41.6% and mortality was 13.20% in postoperative period (Table 3).

Table 3: Distribution of cases according to post-operative complications and mortality.

Total cases	No. of cases with complications	%	Mortality	%
271	113	41.6	36	13.2

Pulmonary complications were the commonest (30.2%), followed by local complications (27.6%), and followed by general complications (26.5%). Cardiovascular (5.9%) were the least common post-operative complications (Table 4).

ARDS was the commonest pulmonary complication (8.9%); followed by tracheobronchitis (8.1%) (Table 5).

Table 4: Distribution of complication.

Complications	Cases	% (n=271)
General	72	26.5
Local complications	75	27.6
CVS complications	16	5.9
Renal complications	70	25.83
GI complications	21	7.74
Pulmonary complications	82	30.2

Table 5: Distribution of cases according to post-operative pulmonary complications.

Complications	No. of cases	Percentage (n=271)
Tracheobronchitis	22	8.1
Bronchopneumonia	16	5.9
Pleural effusion+empyema	10	3.7
Atelactasis	10	3.7
ARDS	24	8.9

DISCUSSION

In spite of many advances in the case of the surgical patient, pulmonary problems continue to constitute the major post-operative complications.

The incidence of postoperative pulmonary complication following abdominal surgery have variably reported from 5-60% by Stein M et al, Latmeir et al, Bartlett RH et al and Lord.[11-15]

In recent study Deodhar SD et al reported incidence of 54.2% following upper abdominal surgery, out of 67 patients who underwent surgery 37 patients developed postoperative pulmonary complications. In another study of Masood J et al who performed their study in all patients who underwent surgery in 2004. A total 501 patients were admitted during the study period, 258 (62.8%) were elective and 153 (37.2%) were emergency procedures. Post-operative pulmonary complications developed in 29 (7.0%) cases.[16] Goreth L et al studied 260 patients, out of those, 75 (28.2%) developed postoperative pulmonary complications.[17]

They found age more than 50 years, BMI <21kg/m^2 and upper/lower abdominal incision independently associated with post-operative pulmonary complications. They also demonstrated that patients subjected to multiple procedures tend to be at high risk of postoperative pulmonary complications. In a recent study Smith PR et al who conducted a retrospective study of all laparotomies in adult patients on general service at university affiliated hospital 2004, out of 359 patients 25 (7.0%) developed postoperative pulmonary complications. [18]

In the present series author found overall incidence of post-operative complications to be 30.2% which is comparable to other series.

From present study author can conclude that post-operative pulmonary complications continue to be a significant morbidity following emergency laparotomies. Preoperative risk factors include smoking history, preexisting lung disease and cardiac dysfunction. Emergency nature of the procedure, long duration operation and midline incision are the other factors that can increase the risk of PPC. Early identification and aggressive treatment goes a long way to tide over the progress to a life-threatening state.

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