



EVALUATION OF POSTOPERATIVE SURGICAL DEATHS IN ADULTS

General Surgery

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ABSTRACT

Audit of surgical mortality provides an overview of the leading causes of death in patients who require surgical care thus identifying system or process error and trends in deficiency of care and it helps develop strategies to reduce deaths in the surgical arena. The basic aim of any surgical therapy is to cause reduction in morbidity and mortality rates. It is done by comparing the influence on adverse outcome. The overall goals of the study were to determine the incidence of postoperative mortality at the tertiary care hospital and to identify risk factors for postoperative mortality. In effect this means collecting data on all patients treated including details of adverse outcomes such as deaths and complications. Evaluation of the data of postoperative surgical deaths in 144 patients from August 2018 to September 2020 is done. Study group with multiple comorbidities and undergoing major operations with more intraoperative and postoperative complications are prone for higher mortality.

KEYWORDS

audit, postoperative, comorbidities, mortality

Clinical audit is one of the “keystones” of clinical governance. A Surgical department that subjects itself to regular and comprehensive audit should be able to provide data to current and prospective patients about the quality of the services it provides, as well as reassurance to those who pay for and regulate health care. Well-organized audit should also enable the clinicians providing services to continually improve the quality of care they deliver. Medical research related to the assessment of perioperative risk factors and its correlation with the Surgical Intensive Care Unit outcomes is limited; hence an audit would potentially reveal additional new information, contribute to improve intensive care outcomes, and resource utilization, thereby reducing the economic burden on the patient and hospital.

The overall goals of our study were to determine the incidence of postoperative mortality at our tertiary care hospital and to identify risk factors for postoperative mortality. The potential risk factors evaluated were patient age, sex, American Society of Anaesthesiologists(ASA) grade, time under anaesthesia care, emergency or elective status and the occurrence of a perioperative adverse events.^[1]The principal objective is to inform, educate, and facilitate change and improve quality of practice in surgical setting. Therefore, strategies to pre-empt and hence prevent the terminal events leading to the expiry of any given patient can be devised.

METHODOLOGY

This study is a Retrospective Observational study including 144 patients with age more than 18 years with postoperative mortality within 30 days at a tertiary health care centre with proper permission of Ethical committee over a span of 2 years from August 2018 to September 2020.

OBSERVATION

The most common age group was 51-60 years with 40 cases(28%) and 90 patients were male(62%) and 54 patients were female(38%); Male : Female ratio being 1.7:1. The most common comorbidity was Diabetes mellitus(22.02%), followed by hypertension(16.66%).

Intestinal perforation was the most common aetiology accounting to 27%, followed by intestinal obstruction up to 13%, leading to postoperative surgical deaths. Among intestinal perforation, ileal perforation was the most common(9%). Majority (88%) were operated on emergency basis while 12% cases were operated on routine basis. Most of the study subjects having postoperative mortality were of ASA grade III(55%). Commonest surgical procedure with postoperative surgical deaths was Resection and anastomosis (28.47%).

Majority of cases (59%) with postoperative surgical deaths had duration of anaesthesia more than 3 hours. In 51% cases blood loss

[approximately >300ml] was the major intraoperative complication. Septicaemia was the commonest postoperative complication (85%). Majority of postoperative death occurred within 2 to 7 days (43%).

Table 1 Etiology of Postoperative mortality

Sr.no	Etiology	Number of deaths	Percentage%
1	Intestinal perforation	39	27
2	Intestinal obstruction	19	13
3	Malignancies	15	10.4
4	Peripheral Vascular diseases	10	7
5	SMA thrombosis	9	6
6	Diabetic foot	7	5
7	Lower limb cellulitis	7	4
8	Fournier's gangrene	6	4
9	Abdominal wall cellulitis	5	3
10	Acute appendicitis/ appendicular perforation	4	3
11	Ileocecal TB	4	3

Table 2 Postoperative Complications in the Study Population

Sr.no	Postoperative complications	Number of deaths	Percentage %
1	Septicaemia	122	85
2	Shock	63	44
3	Acute kidney injury	27	19
4	Dyselectrolytemia	19	13
5	Wound gape	14	10
6	Myocardial ischemia	9	6
7	MODS	7	5
8	ARDS	5	3.5
9	Anastomotic leak	4	3
10	Aspiration pneumonitis	4	3
11	Necrotising fasciitis	2	1.4
12	Hypalbuminaemia	2	1.4
13	Hypoxic encephalopathy	1	0.7

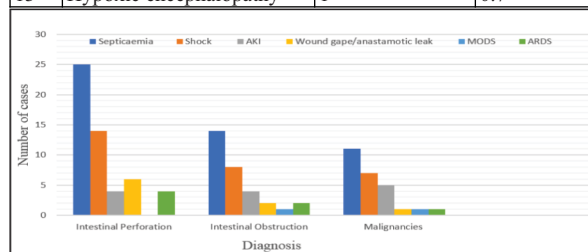


Figure 1 Column chart comparing Diagnosis and Complications

Table 3 Postoperative day of Death in the Study Population

Sr.no	Postoperative day of death	Number of deaths	Percentage
1	Within 24 hours	12	8
2	1-2 days	35	24
3	2-7 days	61	43
4	7-30 days	36	25

DISCUSSION

Audit of surgical mortality provides an overview of the leading causes of death in patients who require surgical care thus identifying system or process error and, trends in deficiency of care, and it helps develop strategies to reduce deaths in the surgical arena.

1.Age:

In present study, commonest age group of postoperative surgical deaths in study population was 51 - 60 years. Jakobson T et al. (2014)^[2], Ahmed M et al.(2020)^[3], and Heeney A et al.(2014)^[4] observed most common age group 61-70 years and 71-80 years respectively in their studies. The early age of postoperative surgical deaths in present study is due to late presentation with poor nourishment and preoperative general condition of the patients.

2.Comorbidities:

In present study, most common comorbidity in postoperative surgical death patients was diabetes mellitus seen in 37 patients(25.69%) followed by hypertension in 28 cases(19.44%). Forrest JB et al. (1992)^[13], Noordzij PG et al. (2010)^[5], and Stefani LC et al.(2018)^[6] observed hypertension in 13.5%, 26.9%, and 12.2% respectively in their studies. Noordzij PG et al. (2010)^[5], and Stefani LC et al.(2018)^[6] observed diabetes mellitus in 34.3% and 10.9% respectively in their studies.

When multiple comorbidities were taken into consideration it was seen that the mortality was 20.13% which was greater as compared to isolated hypertension(8.33%) and isolated diabetes mellitus(13.19%).

3.ASA grade:

ASA grading was grade II in (4%) 06 cases, grade III in (55%) 79 cases, grade IV in (35%) 50 cases and grade V in (6%) 09 cases with postoperative surgical deaths in present study. Similarly, Ahmed M et al.(2020)^[3] and Stefani LC et al.(2018)^[6] noticed majority of postoperative surgical deaths in patients with ASA grade III.

Table 4 Comparison of ASA grading in different studies.

Sr.no	ASA grading	Present study %	Ahmed M et al.(2020) ^[3] %	Stefani LC, et al.(2018) ^[6] %
1	I	0	4.6	0.6
2	II	4	25.6	12.5
3	III	55	48.9	44.5
4	IV	35	18.6	21.3
5	V	6	2.3	7.2

Note: Majority of patients were operated under ASA grade III. Similar findings were noted in studies conducted by Ahmed M et al.(2020) and Stefani LC et al.(2018) which goes in accordance with our study.

4.Etiology:

Most common etiology leading to postoperative surgical deaths was intestinal perforation 27%, followed by intestinal obstruction 13%. Similarly, Ahmed M et al. (2020)^[3] in his study observed intestinal perforation in majority(45%) of patients, followed by intestinal obstruction (31%) and Naoto Fukuda et al. (2012)^[14] reported (25.5%) cases of intestinal perforation and majority as intestinal obstruction (36.1%). The mortality in the above said cases may be due to associated peritonitis, septicemia, acute kidney injury, dyselectrolytemia etc.

5.Surgical Intervention:

In present study, majority of cases underwent resection and anastomosis (28.47%) resulting in death; could be due to poor general condition of the patient, associated comorbidities, prolonged duration of anaesthesia, contamination, intraoperative blood loss and postoperative complications. Studies conducted by Ahmed M et al.(2020)^[3] and Tolstrup et al.(2016)^[9] observed resection anastomosis as the most common procedure in 25.5% cases and 20% cases respectively as most common procedure resulting in mortality.

6.Type of Procedure:

In present study, emergency procedure was done in majority of cases

88% while only 12% cases operated as routine procedures had mortality. Similarly, Bindroo S et al.(2015)^[7] observed that the majority of deaths (70%) occurred in patients admitted as emergencies.

In electively operated cases majority of death was due to malignancy deaths immunocompromised status in malignancy could have lead to mortality.

7.Intraoperative Complications:

In present study, blood loss was more than 300ml in 51% cases. Lars Tue Sorensen et al (2007)^[10] in his study found intraoperative blood loss in 57% patients which had significant impact on mortality.

Matsuyama T et al. (2013)^[12] observed that state of shock, deteriorated consciousness level, haemorrhage requiring blood transfusion, cardiovascular surgery, surgeries at night. Surgeries of **duration more than 2 hours** cause patients to be strongly susceptible to postoperative mortality or morbidity in emergency surgeries.

8.Duration of Anaesthesia:

In present study, majority of cases (59%) with postoperative mortality had duration of anaesthesia more than 3 hours. Fecho K et al.(2008)^[8] conducted a retrospective study in which the time under anaesthesia care was identified as risk factor and concluded time of anaesthesia is directly proportional to mortality of the patients. This can be seen in this study as more the duration of operative procedure and anaesthesia more is the mortality seen.

9.Postoperative Complications:

In Present study, majority of cases had septicemia (85%) and shock (42%) during postoperative period. Tan KK, et al.(2010)^[11] observed in 14.9% cases cause of death was septicemia. Stefani LC et al. (2018)^[6] also reported most common cause of death in postoperative patients to be sepsis.

The above mentioned studies were conducted in a developed country in a quaternary institute with patients having preoperative general condition and nourishment being much better as compared to the present study. Postoperative complications were also less in their studies owing to delayed deaths.

CONCLUSION

Factors associated with postoperative outcome of the patient can be broadly classified into patient factors and operative interventions.

Patient factors leading to increased mortality include elderly age group, associated comorbidities, the general condition of the patient pertaining to the diagnosis.

Operative interventions also play important role as it includes anaesthesia as well surgical factors – ASA grading, type of surgery, duration of anaesthesia, intraoperative and postoperative complications.

Therefore, elderly age group with multiple comorbidities and patients undergoing major laparotomies under ASA grade III and IV with prolonged duration of anaesthesia and more intraoperative and postoperative complications are prone for higher mortality.

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