



INCIDENCE, PATIENT CHARACTERISTICS AND OUTCOME FOR UNANTICIPATED INTENSIVE CARE UNIT ADMISSION FOLLOWING ELECTIVE SURGERY

Anaesthesiology

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ABSTRACT

The basic aim of this study was to evaluate unanticipated intensive care unit admissions after elective surgery and to characterise the patient population and the types of problems that were associated with these admissions. The study was conducted over a period of 6 months at our institute. There were a total of 23 ICU admissions out of 1552 elective surgeries. The patients were divided into two groups: ANTICIPATED (patients for whom it was decided pre-operatively that intensive care unit admission would be necessary) and UNANTICIPATED (patients in whom ICU admission was not anticipated pre-operatively). An overall ICU admission rate of 1.4% was observed. The risk factors for ICU admission were male sex, ASA grade 3/4/5, abdominal surgery, general anaesthesia, intra-operative persistent tachycardia, major blood loss, hypotension requiring inotropic support.

KEYWORDS

INTRODUCTION

Adverse events (AEs) are unintentional complications that occur from healthcare management. They lead to death, disability, critical care admission and prolonged hospital stay.

An unanticipated ICU admission within 24hrs of surgery is an unfavourable outcome that results due to multiple inherent risk factors associated with patient, anaesthesia and surgical procedure.

The aim of this study was to evaluate unanticipated ICU admissions from the operating room and to characterise the patient population and the types of problems that were associated with these admissions.

MATERIALS AND METHODS

The present study was conducted in our institute over a period of 6 months. We defined UIA as an ICU admission that was not anticipated preoperatively but was due to an adverse event occurring within 24 hrs after elective surgery.

EXCLUSION CRITERIA

1. Cardiac surgeries and neurosurgeries were excluded as majority of these patients were routinely needed postoperative ICU care
2. Patients who were already admitted to ICU preoperatively
3. Patients who needed ICU care after 48hrs postoperatively
4. Emergency surgeries

The patients were divided into two major categories:

-Group A : including patients for whom postoperative ICU admission was anticipated.

-Group UA: including patients with unanticipated ICU admission due to some perioperative adverse event.

The major reasons for postoperative admission to ICU were:

1. Low GCS score
2. Pulmonary edema
3. Prolonged hypotension and need for inotropic support
4. Arrhythmias
5. Cardiac arrest
6. Elevated PaCO₂
7. Pneumonia
8. Upper airway obstruction

OBSERVATIONS AND RESULTS

There were a total of 23 ICU admissions to the surgical ICU during the 6 month study period.

The collected data was put under 4 main heads:

1. Preoperative factors

2. Operative factors
3. ICU Admission
4. Final Outcome

Preoperative Factors

Age and Sex						
	Male	Female	Total			
	n	%	n	%	n	%
0-20yrs	1	4%	0	0	1	4%
20-40yrs	2	9%	1	4%	3	13%
40-60yrs	4	17%	5	22%	9	39%
>60yrs	5	22%	5	22%	10	44%
Total	12	52%	11	48%	23	100

Maximum ICU admissions were in the age group above 60yrs (44%), and males accounted for nearly 52% of the total admissions to the ICU.

ASA Grading		
	n	%
I	1	4%
II	2	9%
III	9	39%
IV	11	48%
V	0	0
Total	23	100%

Out of the total 23 ICU admissions, maximum number of patients belonged to ASA Grade III and IV.

Operative Factors

Surgical Procedures		
	n	%
Abdominal	10	44%
Urological	0	0%
Obs & Gyn	3	13%
Orthopaedic	3	13%
ENT	6	26%
Misc.	1	4%
Total	23	100

Out of the total 23 patients admitted to the ICU, 44% underwent abdominal surgery, 26% underwent ENT surgery and 13% underwent orthopaedic and obs & gyn surgeries each.

Anaesthetic Technique		
	n	%
GA	18	78
Regional + Nerve blocks	5	22
Total	23	100

It was observed that majority of the patients requiring postoperative ICU care (78%) were administered general anaesthesia.

Duration of Procedure		
	n	%
<2hrs	3	13%
2-4hrs	9	39%
>4hrs	11	48%
Total	23	100

ICU Admission

Adverse event leading to unanticipated ICU admission		
	n	%
Respiratory	2	40%
Cardiac	1	20%
Neurological	1	20%
More than 2 of the above	1	20%
Total	5	100

Final Outcome

Final Outcome						
	Anticipated		Unanticipated		Total	
	n	%	n	%	n	%
Discharge	16	69%	4	18%	20	87%
Death	2	9%	1	4%	3	13%
Total	18	78%	5	22%	23	100%

It was observed that out of the total 18 anticipated ICU admissions, 16 were discharged (69%), while 2 patients died (9%), while out of the total 5 unanticipated ICU admissions, 4 were successfully discharged (18%) whereas 1 patient died (4%).

DISCUSSION

Little is known about elective surgical AEs resulting in unanticipated ICU admission.

Unanticipated ICU admission is associated with a negative outcome and imposes large financial costs on healthcare systems.

In the present study an unanticipated ICU admission rate of 0.3% was observed. It is less than that reported by Piercy et al. (0.79%) and higher than that reported by Quinn et al. (0.12%).

The reasons behind such variations could be sample size, exclusion criteria, definition of UIA.

In relation to data analysed by Quinn et al, association was between UIA and advanced age and higher ASA grade.

In the present study it was observed that patients undergoing abdominal surgery had a higher chance of needing UIA. Similar results were found by Haller et al.

Majority of the literature showed a trend of lower UIA after surgery performed under regional anaesthesia versus GA. In this study, 78% of UIA occurred after surgery under GA.

In the present study, major intraoperative bleeding, cardiovascular and respiratory adverse events in the postoperative period were major factors contributing to UIA. Similar results were found by Quinn et al. While Bhat et al. have found that persistent tachycardia, hypotension requiring use of vasoactive drugs were the main reason for UIA.

The mortality rate in the present study was 22%. This rate is higher than that found by Quinn et al., which did not exceed 0.64%. However, it is lower than that found by Okafor (30.7%). And Bhat et al. (36.2%).

Given the limited data available and only handful of studies in the literature, we hope this study will help gain insight into better perioperative anaesthetic and surgical care to lessen the burden of UIA.

CONCLUSION

Unanticipated ICU admission after elective surgery is a rare event with negative outcomes and is an indicator of quality of entire perioperative care.

The following factors are responsible for need of majority of postoperative ICU admission care:

1. Male sex and above 60 age group

2. ASA grade III and IV
3. Abdominal surgery
4. Oxygen saturation <90% on room air
5. Intraoperative major blood loss, hypotension with inotropic support

The present study has provided valuable insight and will allow us to improve the overall standards of anaesthetic practice.

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