AUDIT REPORT

Improving Quality of Practice in Intensive Care Unit of Teaching Hospital by Clinical Audit

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ABSTRACT

Aim: To audit the pattern of patients who were admitted in ICU of Lahore General Hospital with objective of modifying current practices, if required, preceding to better quality care and patient outcome.
Study design: Retrospective clinical audit.
Place & duration of study: Surgical ICU, Lahore General Hospital, November 2019 to November 2020.
Methodology: All patients who were admitted form 1st November 2019 to 17 November 2020 in Surgical ICU Unit phase 3 were included in the study. The data was collected through ICU Price Registry and analysed through electronic medical record.
Results: Study patterns reveal that mortality was highest in patients with gastrointestinal surgery/disease with 37.7%. The second most mortality was seen in patients with trauma having 20% mortality percentage. Average age of patient is 33 years with maximum patients in younger age group of 19 to 39 years. Majority of patients were admitted with gastrointestinal surgery with 18.9% followed by caesarean section, trauma and genitourinary surgery. Overall outcome at discharge shows mortality percentage was 21.5%.
Conclusion: Sepsis remains the main cause of mortality in surgical ICU of Lahore General Hospital and the quality care and outcome can be improved by early recognition, appropriate use of antibiotics and early surgical intervention following standard protocols.
Keywords: Critical Care Unit, mortality, outcome, sepsis

INTRODUCTION

Critical care units are dedicated wards in hospitals that deliver management and monitoring for patients who are critically ill. Audit of these specialised units is an essential element for quality improvement. A clinical audit cycle identifies problems, defines standards, collects data, implement changes and then re-audit[1]. Such type of data stipulate baseline assessment of disease incidence and severity, mortality, short comings in the institute, objectives for research and improvement in quality practice[2].

The objective of advance healthcare system is to provide finest possible care to patients and is fundamental to all quality improvement tasks[3]. Though, accomplishment of best health care in critical care unit is quite challenging due to immense costs, critical patients, time strain, complex procedures and rising requests for critical care facilities[3].

Intensive care units have always high mortality rate as compared to other units of hospital; thus the mortality statistics may give us some idea about overall health of population and policies can be made on curative and preventive measures[4]. Many factors like health care services, management, demographic features and infrastructure are all associated with patient mortality[4]. Therefore an audit of intensive care unit on mortality pattern gives us prospect to improve the quality and standard of care services.

This study is therefore carried out to audit the pattern of patients who were admitted in one year in surgical ICU of Lahore General Hospital and to see their outcome with objective of modifying current practices, if required, preceding to better quality care and patient outcome.

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METHODOLOGY

After taking permission from Ethical Review Committee of Lahore General Hospital, a retrospective clinical audit was carried out. All patients who were admitted form 1st November 2019 to 17 November 2020 in Surgical Intensive Care Unit phase 3 were included in the study. The data was collected through ICU Price Registry and analysed through electronic medical record.

The variables considered were age distribution, gender distribution, distribution of patients according to speciality co-related with top ten APACHE IV conditions, average length of stay of patients in ICU, number of patients on mechanical ventilation, average days of patients on mechanical ventilation, outcome of patients (alive/dead), outcome of patients according to primary pathology and co-related with top ten APACHE IV conditions, patients on cardiovascular support and apache score. The data was recorded and statistically analysed through Microsoft excel.

RESULTS

A total of 451 patients have been admitted between November 2019 and 17th November 2020, with daily admissions ranging from none to three (Fig. 1).

Out of these, 367 patients (81.4%) were admitted postoperatively and 84(18.6%) were non-operative. Average age of patient is 33 years with maximum patients in younger age group of 19 to 39 years. Female patients were 266(59%) (n=266) as compared to males which were 185(41%) (Figure 2). Majority of patients were admitted with gastrointestinal, surgery with 85(18.9%) followed by caesarean section, trauma and genitourinary surgery. Other patients with top 10 diagnosis is shown in figure 3.

Whereas mortality was highest in patients with gastrointestinal surgery with 32(37.7%) followed by patients admitted with trauma having 8(20%) (Figure 3), while overall outcome at discharge shows mortality percentage was 21.5%. Mortality percentage in non-operative patients was 27(32.9%), postoperative patients was 69(18.9%) and invasively ventilated patients was 78(41.5%) (Fig. 4).

At admission, 177 patients were invasively ventilated (36.7%) and only 1 patient was non-invasively ventilated (0.2%) while 268 patients (60.1%) were self ventilated. Cardiovascular support was started in 105 patients (23.5%) at admission while median length of stay in ICU was 3 days.

Other characteristics of patients regarding Median APACHE score, number of patients on mechanical ventilation during the stay and duration of mechanical ventilation in days is shown in table 1.

Table 1:

Characteristics N=451	**n(%)**
Route to admission	
Non operative	84(18.6%)
Postoperative	367(81.4%)
Ventilation at admission	
Invasive ventilation	17(36.7%)
Non invasive ventilation	1(0.2)
Self ventilation	268(60.1%)
Not recorded	5
Cardiovascular support at admission	
Yes	105(23.5)
No	341(76.5)
Recorded	5
Length of stay (ICU) in days, median(Q3,Q1)	3(5,1)
Median APACHE score (Q3,Q1)	
Overall	26(37.18%)
Non operative	21.5
Postoperative	26(37.18%)
	142(48.3)
Median APACHE score (Q3)	3(7,1)

*data is available after 15th February 2020

Figure 1: Number of admissions by month

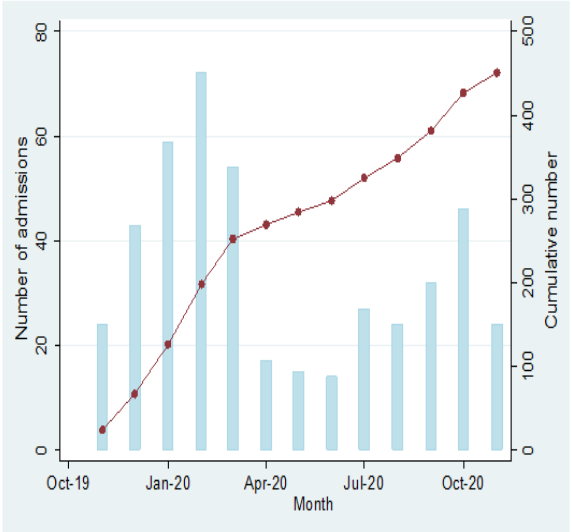


Fig.2: Age group and gender distribution

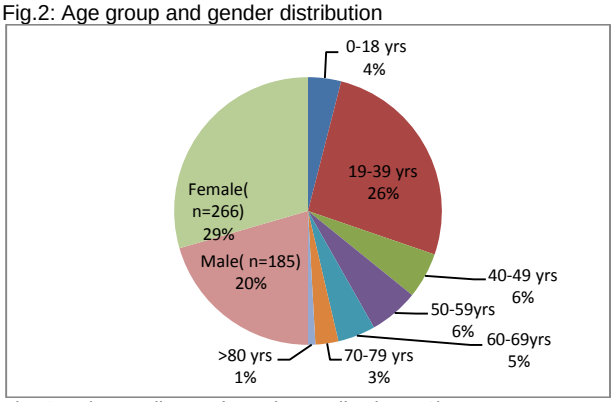


Fig. 3: Primary diagnosis and mortality (top 10)

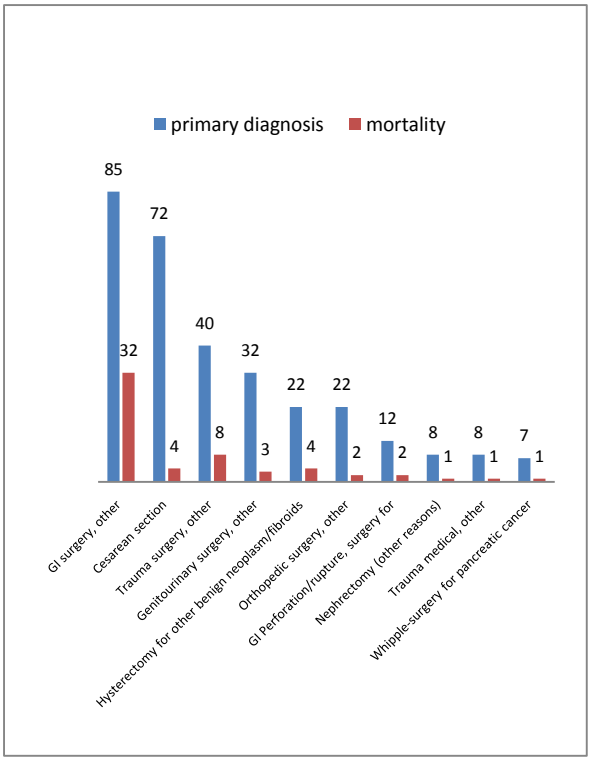
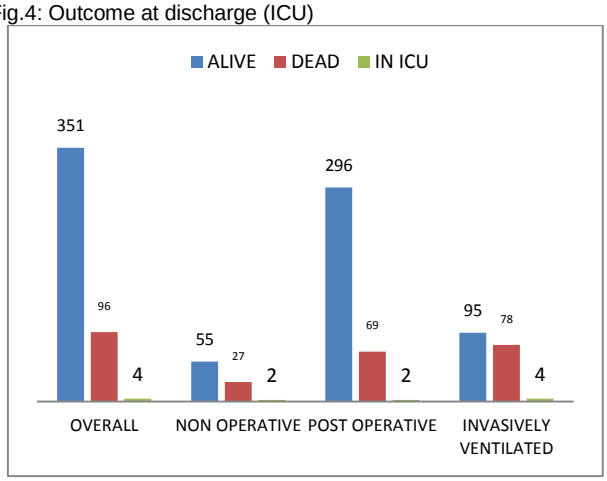


Fig.4: Outcome at discharge (ICU)



DISCUSSION

Approach to manage critically ill patient is always multi-disciplinary and involves multiple laboratory tests, radio imaging and extensive medications. Countries having limited resources, like Pakistan, patient outcome, somehow, is also related to financial limitations. Lahore General Hospital is one of the biggest tertiary care and referral hospital and Surgical ICU is also well equipped but still with many limitations. Most of the patients who are referred from periphery and District Hospitals reach in already severe sepsis state with delayed or inappropriate treatment.

This audit presents the profile of patients who were admitted in surgical icu over the span of one year which shows that most of the patients were admitted with gastrointestinal surgery/disease (n=85) at time of diagnosis which is 18.9% followed by patients with caesarean section (n=72) with 16% and then post operatively after trauma (n=40) with 8.9%.

Consequently mortality was also highest in patients with gastrointestinal surgery/disease with 32(37.7%). The mortality rate was less in patients after caesarean section (n=4) with 5.6%; the second most mortality was seen in patients with trauma having 8(20%) mortality percentage.

Our results are quite comparable with other developing countries but mortality is higher when compared with the developed countries. Audit conducted in Nepal by Acharya et al. in one year shows the overall mortality of 246(32.8%) which was higher than our results showing mortality percentage of 21.5%[5].

The study by Alam MR et al in Intensive Care Unit of a Level III Military Hospital of Bangladesh shows that sepsis remains the leading cause of death in their study[6]. The audit results of our study shows that the sepsis either of gastrointestinal surgeries or after trauma, is the main cause of death in critical care unit. This is because mostly patients are referred from periphery in already severe sepsis state. The mortality also depends on presence of comorbidities which has a significant impact on outcome of patient[7]. Additionally hospital-acquired infections affect the patients admitted in critical care units leading to increased mortality[8].

So there is need of applying scoring system at the time of admission which is poorly documented in our setup. Sepsis is a worldwide disease with high mortality and incidence is also increasing. Nowadays, mortality rate is varies from 20% to 30%[9]. In the retrospective cohort study carried out at the Maastricht University Medical Centre by R.G.H. Driessen et al. shows the high mortality percentage of 40% in septic patients. Identifying the cause and predictors of death in septic patients in critical care unit is essential to improve outcome of patients[10].

Antimicrobials remain the mainstay for treatment of sepsis and optimizing its use is crucial to make certain the effective outcome and to decrease side effects as well as developing resistance to antibiotics[11]. The broad spectrum antibiotics should be started, as early as possible, within first hour of recognition of sepsis according to 2016 Surviving Sepsis Campaign (SCC) guidelines[12,13].

Martínez ML et al in their study recommended to follow antimicrobial stewardship, optimize duration and de-escalation to improve the quality care of patients admitted in intensive care units[11].

Measures should be taken to eradicate the infective focus and continuing contamination to re-establish normal anatomy and physiology[14]. According to the SSC guidelines, this should be carried out in first twelve hours of diagnosis with minimum invasive procedures[15]. The technique used for the control of infective focus will differ on the type and site, hazards and resources of the hospital[16]. Buck DL et al in his recent study shows that delay in every hour in surgery in patients with perforated peptic ulcer will lead to increased mortality[17].

Unfortunately, although the guidance is available for best practices but still there are significant barriers in applying Surviving Sepsis Care bundles in our country. Firstly, there is delay in recognition of sepsis in primary care hospitals leading to delay in commencement of optimum treatment and management. Furthermore, the quality care of the patients in critical care units requires multidisciplinary approach with effective coordination between surgeons and critical care team. Senior surgeons should re-evaluate patients frequently and interventions should be carried out quickly and efficiently with the help of care protocols.

Therefore there is need to improve the standard of care in ICU by providing early and prompt care, with requirement of early surgical intervention, appropriate use of antibiotics and following more efficiently standard protocols. One of the limitation of the study was limited variables were considered. Studying more variables may reveal more clear and different inferences.

CONCLUSION

By studying the pattern of patients, it is observed that sepsis remains the main cause of mortality in surgical ICU of Lahore General Hospital and quality care and outcome can be improved by early recognition, appropriate use of antibiotics and early surgical intervention following standard protocols.

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