

Clinical Audit Evaluation of Septic Shock Management in Medical Unit, Ayub Teaching Hospital A Retrospective Analysis and Comparison with Updated NICE Guidelines

Amina Aman¹, Yasir zeb², Zaboora Khan Burki³

1. Resident PGY-IV Internal Medicine CMH Abbottabad Kpk Pakistan.
2. Resident PGY -III Cardiology Department Ayub Teaching Hospital Abbottabad Kpk Pakistan.
3. Resident PGY-2 Internal Medicine CMH Abbottabad, Kpk Pakistan

Corresponding author: Yasir zeb²

Email: yasirzeb363@gmail.com

Date Received: Aug-15-2022

Date Accepted: Feb-03-2023

Abstract

Background: Septic shock is a critical condition requiring prompt and effective management to improve patient outcomes. This clinical audit evaluates the adherence to updated NICE guidelines for septic shock management in the Medical Unit at Ayub Teaching Hospital.

Aims & Objectives: Evaluate the proportion of septic shock patients among all admissions. Assess adherence to updated NICE guidelines for septic shock management. Analyze demographic Distribution of septic shock patients. Review management practices including oxygen administration, blood cultures, fluid resuscitation, serum lactate measurement, broad-spectrum antibiotics, and norepinephrine support. Evaluate patient outcomes (recovery vs. mortality).

Methods: A retrospective analysis was conducted from Jan 10, 2023, to March 10, 2023, involving 34 septic shock patients out of 450 total admissions. Data were collected on demographics, management practices, and patient outcomes. Adherence to key components of the NICE guidelines, including oxygen administration, blood cultures, fluid resuscitation, serum lactate measurement, broad-spectrum antibiotic use, and norepinephrine support, was assessed.

Results: Of the 34 patients, 59% were female, and 88% were over 50 years old. The most common cause of sepsis was urosepsis (44%). Adherence to guidelines varied: oxygen administration (65%), blood cultures before antibiotics (53%), fluid resuscitation (50%), norepinephrine support (45%), serum lactate measurement (56%), broad-spectrum antibiotics (50%), and urine output monitoring (62%). The overall mortality rate was 59%.

Conclusion: Significant deviations from NICE guidelines were observed, particularly in timely antibiotic administration, fluid resuscitation, and norepinephrine support. These deficiencies likely contributed to the high mortality rate. Recommendations include staff training, protocol improvements, and continuous audits to enhance guideline adherence and patient outcomes.

Keywords : Septic shock management, NICE guidelines, adherence, mortality

Citations

Amina Aman, Yasir zeb, & Zaboora Khan Burki. (2024). Clinical Audit Evaluation of Septic Shock Management in Medical Unit, Ayub Teaching Hospital A Retrospective Analysis and Comparison with Updated NICE Guidelines: Clinical Audit. *Pakistan Journal of Advances in Medicine and Medical Research*, 2(01), 132–136. <https://doi.org/10.69837/pjammr.v2i01.48>

Clinical Audit Evaluation of Septic Shock Management in Medical Unit, Ayub Teaching Hospital: A Retrospective Analysis and Comparison with Updated NICE Guidelines

Introduction

Septic shock is a clinical condition involving derangements in circulatory, cellular and metabolic functioning, and the consequences will lead to increased mortality and therefore, needs rapid and more tailored interventions based on the literature. Thus, the approaches to managing septic shock differ around the world; however, in recent years new guidelines have been published, including the National Institute for Health and Care Excellence (NICE) and the Surviving Sepsis Campaign. These include first, maintaining isotonic intravenous hydration, second, commencement of antibiotics and third and administration of vasopressors with the aim of improving survival rates [1- 3]. However, compliance with these guidelines in actual clinical practice is somewhat low, and thus patients' outcomes deteriorate, and mortality rises [4]. This clinical audit was carried out in the medical unit of Ayub Teaching Hospital, Abbotabad Pakistan to determine their compliance to the updated NICE guidelines for septic shock management. Through review of case papers of patients from ER admitted over a two month period for septic shock, this audit aimed at determining areas of clinical care that lacked compliance with the standard care protocols and the extent to which the care given varied from the protocol in an attempt to explain the deaths in outcomes of the septic shock patients. The issues to emerge from the audit relate to the timeliness of broad-spectrum antibiotic administration, fluid resuscitation, and the norepinephrine in refractory cases. These points will help to improve the further experience of clinicians in the treatment of septic shock, reduce the percentage of fatalities among patients with such a condition.

Materials and Methods

This was a retrospective clinical audit conducted in the Medical Unit of Ayub Teaching Hospital, a 1,460-bed tertiary care government hospital located in Abbottabad, Pakistan. The audit evaluated the management of septic shock patients in relation to updated NICE guidelines. Data collection was performed using a structured questionnaire, reviewing medical records, prescription data, and treatment protocols. The audit covered a two-month period, from Jan 10, 2023, to March 10, 2023.

Sample size & collection

The sample for this clinical audit was drawn from all patients admitted to the Medical Unit of Ayub Teaching Hospital between April 10, 2023, to June 10, 2023. Out of 450 total admissions during this period, 34 patients were diagnosed with septic shock based on clinical criteria. These 34 patients formed the audit sample. Data on demographics, management practices, and outcomes were collected retrospectively from medical records

Data Analysis

Data were analyzed using Microsoft Excel 2023 (Microsoft® Corp., Redmond, WA), and graphs were made using Microsoft Office Word 2023 and Microsoft Excel 2023. Grammar was checked on the Grammarly software application.

Ethics

The institute does not require ethical approval for this study due to its retrospective nature. However, the study has been authorized by the Medical director of the ATH.

Standard

The standard for this clinical audit was based on the updated National Institute for Health and Care Excellence (NICE) guidelines for the management of septic shock.

Updated NICE Guidelines for Septic Shock Management

Oxygen Administration: Maintain SpO₂ above 94% (88-92% for COPD patients).¹

Blood Cultures: Obtain before administering antibiotics.³

Fluid Resuscitation: Administer 500 mL crystalloids bolus within 15 minutes. If the patient does not respond, start norepinephrine support.²

Serum Lactate Measurement: Measure serum lactate levels.¹ Antibiotics: Administer broad-spectrum antibiotics within 1 hour of presentation, including 3rd generation cephalosporin, carbapenems, and piperacillin-tazobactam, in addition to vancomycin.

Urine Output Measurement: Measure and monitor accurately.⁵

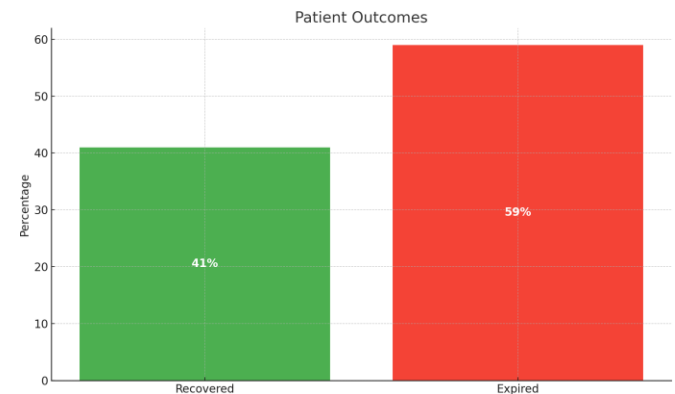


Table 01 : Demographic Gender Distribution

Gender	Number of Patients	Percentage
Female	20	59%
Male	14	41%

Table 02 : Demographic Age Distribution

Age Group	Number of Patients	Percentage
<50 years	4	12%
>50 years	30	88%

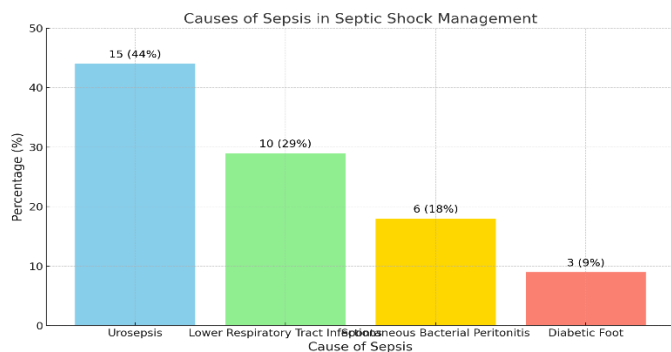


Table 04: Management Practices vs. Updated NICE Guidelines

Management Component	Total Patients	Adhered	Adherence Percentage
Oxygen Administration (>94%)	34	22	65%
Blood Cultures Before Antibiotics	34	18	53%
Fluid Resuscitation (500 mL within 15 minutes)	34	17	50%
Norepinephrine Support (if needed)	34	15	45%
Serum Lactate Measurement	34	19	56%
Broad-Spectrum Antibiotics	34	17	50%
Accurate Urine Output Measurement	34	21	62%

Discussion

The following clinical audit reveals low compliance to international standard guidelines and protocols for the management of septic shock in the context of medical unit of Ayub Teaching Hospital at Pakistan. As such, these outcomes underscore the need to universalize models of practice that can be applied in diverse health care organizations especially the developing world. Even though there are well documented protocols that include NICE and Surviving Sepsis Campaign guidelines, compliance in this audit was poor as revealed by several aspects where they fell lower than the set standards of practice of administering

Antibiotics within 1 hour (50%), initiating fluid administration within 1 hour (50%) and norepinephrine support within 3 hours (45%) [5]. The mortality rate in present cohort was 59% which is much higher than the mortality rate reported in different studies from high income countries where the mortality from septic shock varies between 30%- 50%. This may have resulted from low recognition and early resuscitation of septic shock; with results showing poor compliance with manufacturer’s recommended early blood culture tests (53%) and lactate tests (56%). Our findings are aligned with other LMICs’ experiences that struggle to address sepsis because of short supply of diagnostics, lack of staff education, and system-related issues [6,7]. There was the delay in giving broad-spectrum antibiotics which needs to be given within one hour in 50% of cases in this audit and this was one of the significant factors that contributed to mortality. Antibiotics should be used promptly in septic shock as research has shown that every hour count when treating this condition [8]. As percentages of sepsis, urosepsis was the most (44%) followed by lower respiratory tract infection (29%) these should prompt extra care in management of common sources of sepsis bearing in mind that 88% patients were more than 50 years, a group that has high risk for septic shock. Other concerns highlighted include inadequate fluids administration with prompt use of vasopressors especially norepinephrine. The study had a poor compliance to the 500 mL crystalloid bolus with only 50% of patients getting this within 15 minutes, while norepinephrine was administered in 45% of patients for whom fluid resuscitation had not been effective. These findings can be seen to indicate deficits in training as well as resources, problems also observed in other LMIC contexts. Stakeholder research conducted on different regions of the globe implies that early identification and swift management are critical components in halting the pathophysiologic process in septic shock resulting in enhanced outcomes. Regarding the measurement of output of urine, the compliance was somewhat higher (62%) which can be translated into the improved attention to the evaluation of the renal function and balance of fluids. Despite this, this figure point at directions of improvement as frequent monitoring is relevant in providing further management particularly in patients with potentiality to develop multiorgan dysfunction.

Internationally, enhancing process and outcomes of managing septic shock must be associated with implementation of guidelines pulled together with general development involving changes on systems, staff or audit feedback. Compared to similar audits performed in high-income nations, this have been complements of feedback to clinical teams as well as updates of guidelines and education sessions which have led to enhanced guideline adherence that in turn impacts patient results.

Clinical Audit Evaluation of Septic Shock Management in Medical Unit, Ayub Teaching Hospital: A Retrospective Analysis and Comparison with Updated NICE Guidelines

Recommendations and Future Directions:

Timely Antibiotic Administration: Strict adherence to administering broad-spectrum antibiotics within the 1-hour window must be prioritized. This can be reinforced through staff education and the development of sepsis response teams to initiate treatment rapidly. **Fluid Resuscitation and Norepinephrine Support:** Standardized protocols for fluid administration and vasopressor use should be implemented, with mandatory training to ensure all clinicians are familiar with updated guidelines. **Enhanced Monitoring:** Continuous tracking of key indicators such as lactate levels and urine output should be integrated into routine practice, supported by regular audits to ensure compliance.

System-Wide Improvements: Addressing systemic barriers, such as delays in diagnostic testing and the availability of critical care resources, is essential. Hospital leadership should focus on optimizing resource allocation and streamlining the sepsis management pathway.

Conclusions

This audit illustrates the critical need for improved adherence to septic shock management guidelines in the Medical Unit at Ayub Teaching Hospital. The high mortality rate and deviations from evidence-based practices suggest that focused interventions, including staff training, better resource utilization, and continuous auditing, are essential to improve outcomes. Globally, these findings resonate with the challenges faced by healthcare systems in resource-limited settings, underscoring the universal importance of timely and protocol-driven care in septic shock management.

Disclaimer: Nil Conflict of Interest: Nil Funding Disclosure: Nil

Authors Contribution

Concept & Design of Study: Amina Aman¹, Yasir zeb²

Data Analysis: Amina Aman¹, Yasir zeb², Zaboorkhan burki³

Critical Review: Yasir zeb²

Final Approval of version: Amina Aman¹

References :

1. National Institute for Health and Care Excellence (NICE): Sepsis: recognition, diagnosis, and early management. NICE guideline (NG51). 2016. <https://www.nice.org.uk/guidance/ng51>.
2. Dellinger RP, Levy MM, Rhodes A, et al.: Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock: 2012. Crit Care Med. 2013, 41:580-637.

- doi:10.1097/CCM.0b013e31827e83af
3. Singer M, Deutschman CS, Seymour CW, et al.: The third international consensus definitions for sepsis and septic shock (Sepsis-3). JAMA. 2016, 315:801-810. doi:10.1001/jama.2016.0287
4. Rhodes A, Evans LE, Alhazzani W, et al.: Surviving sepsis campaign: International guidelines for management of sepsis and septic shock: 2016. Crit Care Med. 2017, 45:486-552. doi:10.1097/CCM.0000000000002255
5. National Institute for Health and Care Excellence (NICE): Sepsis: recognition, diagnosis, and early management. NICE guideline (NG51). 2016. <https://www.nice.org.uk/guidance/ng51>.
6. Dellinger RP, Levy MM, Rhodes A, et al.: Surviving sepsis campaign: international guidelines for management of severe sepsis and septic shock: 2012. Crit Care Med. 2013, 41:580-637. doi:10.1097/CCM.0b013e31827e83af
7. Fleischmann C, Scherag A, Adhikari NK, et al.: Assessment of global incidence and mortality of hospital-treated sepsis. Current estimates and limitations. Am J Respir Crit Care Med. 2016, 193:259-272. doi:10.1164/rccm.201504-0781OC



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>. ©The Author(s) 2023