

Prehospital identification of critical infection disease: (A retrospective observational study from South-Rogaland)

SEPSIS



Patient flow

Background

Sepsis is characterized by a dysregulated host response to infection, leading to organ dysfunction and substantial mortality. In septic shock, circulatory failure with hypotension and tissue hypoxia drives mortality rates above 40 % [1]. Early administration of antibiotics is critical, with each hour of delay increasing the risk of death by up to 8 % [2].

In Norway, emergency medical dispatchers (AMK) use the Norwegian Index for Medical Emergencies (NIMN), a symptom-based triage tool that classifies emergencies by the caller's reported complaints. This system is poorly suited for detecting systemic conditions like sepsis, which may present with mild or misleading primary symptoms.

Clinical experience suggests that sepsis is often miscoded in AMK and that the severity of illness may be underestimated throughout the prehospital chain. This study examines which symptom criteria sepsis patients are assigned by AMK, how suspicion of infection or sepsis is documented by ambulance and emergency department staff, and how these assessments affect time to antibiotics, length of stay, and 30-day mortality.

01

PHASE

EMERGENCY DISPATCH (AMK)

Assess patient symptoms using the Norwegian Index for Medical Emergencies (NIMN) to determine urgency and response level.

02

PHASE

AMBULANCE

Paramedics perform on-scene evaluation, record vital signs, and assess infection severity.

03

PHASE

EMERGENCY DEPARTMENT

Patients are triaged on arrival, undergo diagnostic testing, and receive antibiotics according to clinical assessment and sepsis guidelines.

04

PHASE

PAITENT OUTCOME

Clinical endpoints include time to antibiotics, length of hospital stay, intensive care need, and 30-day mortality.

Objective

The study aims to examine how patients later diagnosed with sepsis are triaged throughout the emergency chain. Specifically, it maps index criteria and urgency levels assigned by emergency medical dispatch (AMK), ambulance, and the emergency department, and compares these with clinical outcomes including time to antibiotics, length of stay, and mortality.

Methods

This retrospective observational study includes adult patients (≥ 18 years) admitted with sepsis to Stavanger University Hospital between January 1, 2022, and December 31, 2023. Sepsis was identified in the Norwegian Patient Registry (NPR) using ICD-10 codes A40, A41, R65.0, R65.1, and R57.2. Codes A40 and A41 were required as primary diagnoses, while R65.0, R65.1, and R57.2 could also be accepted as secondary diagnoses when clinically relevant, ensuring sepsis was present on admission.

Patient trajectories were then traced backwards through linked prehospital and hospital records (AMIS, Bliksund/EWA, Meona, DIPS) to evaluate the clinical course from first emergency call to hospital admission.

Collected variables include index criteria, urgency levels, and prehospital suspicion of sepsis, as well as time to antibiotics, length of stay, and 30-day mortality, allowing assessment of diagnostic accuracy and the impact of early recognition across the emergency chain.

Sources

1. Shankar-Hari M, Phillips GS, Levy ML, Seymour CW, Liu VX, Deutschman CS, et al. Developing a New Definition and Assessing New Clinical Criteria for Septic Shock. *JAMA*. 2016 Feb 23;315(8):775. Available from: <https://pmc.ncbi.nlm.nih.gov/articles/PMC4910392/>

2. Kumar A, Roberts D, Wood KE, Light B, Parrillo JE, Sharma S, et al. Duration of Hypotension before Initiation of Effective Antimicrobial Therapy Is the Critical Determinant of Survival in Human Septic Shock. *Critical Care Medicine* [Internet]. 2006 Jun;34(6):1589-96. Available from: https://journals.lww.com/ccmjournal/abstract/2006/06000/duration_of_hypotension_before_initiation_of.1.aspx



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