

## Original Article

# Antibiotic Resistance in Sepsis Patients: Evaluation and Recommendation of Antibiotic Use

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## Abstract

**Background:** The appropriate selection of empirical antibiotics based on the pattern of local antibiotic resistance can reduce the mortality rate and increase the rational use of antibiotics. **Aims:** We analyze the pattern of antibiotic use and the sensitivity patterns of antibiotics to support the rational use of antibiotics in patients with sepsis. **Materials and Methods:** A retrospective observational study was conducted in adult sepsis patient at one of Indonesian hospital during January-December 2011. Data were collected from the hospital medical record department. Descriptive analysis was used in the processing and interpretation of data. **Results:** A total of 76 patients were included as research subjects. Lung infection was the highest source of infection. In the 66.3% of clinical specimens that were culture positive for microbes, *Klebsiella pneumoniae*, *Escherichia coli*, *Staphylococcus hominis* were detected with the highest frequency. The six most frequently used antibiotics, levofloxacin, ceftazidime, ciprofloxacin, cefotaxime, ceftriaxone, and erythromycin, showed an average resistance above 50%. **Conclusions:** The high use of antibiotic with a high level resistance requires a policy to support its rational use. Local microbial pattern based on site infection and pattern of antibiotics sensitivity test can be used as supporting data to optimize appropriateness of empirical antibiotics therapy in sepsis patients.

**Keywords:** Antibiotic resistance, Bacteremia, Sepsis, Systemic infection

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## Introduction

Sepsis is a systemic infection that can lead to complications and death.<sup>[1]</sup> World-wide, 13 million people develop sepsis each year, and as many as 4 million people have died.<sup>[2]</sup> In 1996, there were 4.774 patients admitted to a teaching hospital in Surabaya, Indonesia, and 504 patients were diagnosed as having sepsis, with a mortality rate of 70.2%.<sup>[3]</sup> In a study at a teaching hospital in Yogyakarta, Indonesia, there were 631 cases of sepsis in 2007, with a 48.96% mortality rate.<sup>[4]</sup> A global effort is needed to improve the therapeutic management of

sepsis because of its high prevalence and mortality rate.<sup>[2]</sup>

The therapeutic management of sepsis, including septic shock, requires a comprehensive and systematic approach that includes a diagnostic method, the initiation of empirical antibiotic use and administration of supportive therapy.<sup>[5]</sup> Empirical antibiotic use is needed to eradicate the microbe that causes sepsis. Empirical antibiotic therapy must also consider the site of infection, the common pathogen that caused sepsis and antibiotic sensitivity based on local patterns of antibiotic resistance.<sup>[1]</sup> Failed to define the source of infection will potentially lead to wrong pathogen identified, and will also lead to inappropriate antibiotic selection.<sup>[1]</sup> The global escalation in both community- and hospital-acquired antimicrobial-resistant bacteria is increasingly compromising effective antimicrobial therapy, particularly when it comes to empiric antimicrobial selection.<sup>[6]</sup> The appropriate use of an empirical antibiotic is critical to decrease the mortality rate of sepsis<sup>[1]</sup> and should be started within 1-2 h after the diagnosis of severe sepsis.<sup>[7]</sup>

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