Yoğun Bakım Ünitesi'nde Prokalsitonin

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Enfeksiyon Hastalıkları ve Klinik Mikrobiyoloji AD

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Prevalence and Outcomes of Infection Among Patients in Intensive Care Units in 2017

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IMPORTANCE Infection is frequent among patients in the intensive care unit (ICU). Contemporary information about the types of infections, causative pathogens, and outcomes can aid the development of policies for prevention, diagnosis, treatment, and resource allocation and may assist in the design of interventional studies.

OBJECTIVE To provide information about the prevalence and outcomes of infection and the available resources in ICUs worldwide.

DESIGN, SETTING, AND PARTICIPANTS Observational 24-hour point prevalence study with longitudinal follow-up at 1150 centers in 88 countries. All adult patients (aged ≥18 years) treated at a participating ICU during a 24-hour period commencing at 08:00 on September 13, 2017, were included. The final follow-up date was November 13, 2017.

EXPOSURES Infection diagnosis and receipt of antibiotics.

MAIN OUTCOMES AND MEASURES Prevalence of infection and antibiotic exposure (cross-sectional design) and all-cause in-hospital mortality (longitudinal design).

RESULTS Among 15 202 included patients (mean age, 61.1 years [SD, 17.3 years]; 9181 were men [60.4%]), infection data were available for 15 165 (99.8%); 8135 (54%) had suspected or proven infection, including 1760 (22%) with ICU-acquired infection. A total of 10 640 patients (70%) received at least 1 antibiotic. The proportion of patients with suspected or proven infection ranged from 43% (141/328) in Australasia to 60% (1892/3150) in Asia and the Middle East. Among the 8135 patients with suspected or proven infection, 5259 (65%) had at least 1 positive microbiological culture; gram-negative microorganisms were identified in 67% of these patients (n = 3540), gram-positive microorganisms in 37% (n = 1946), and fungal microorganisms in 16% (n = 864). The in-hospital mortality rate was 30% (2404/7936) in patients with suspected or proven infection. In a multilevel analysis, ICU-acquired infection was independently associated with higher risk of mortality compared with community-acquired infection (odds ratio [OR], 1.32 [95% CI, 1.10-1.60]; $P = .003$). Among antibiotic-resistant microorganisms, infection with vancomycin-resistant *Enterococcus* (OR, 2.41 [95% CI, 1.43-4.06]; $P = .001$), *Klebsiella* resistant to β-lactam antibiotics, including third-generation cephalosporins and carbapenems (OR, 1.29 [95% CI, 1.02-1.63]; $P = .03$), or carbapenem-resistant *Acinetobacter* species (OR, 1.40 [95% CI, 1.08-1.81]; $P = .01$) was independently associated with a higher risk of death vs infection with another microorganism.

CONCLUSIONS AND RELEVANCE In a worldwide sample of patients admitted to ICUs in September 2017, the prevalence of suspected or proven infection was high, with a substantial risk of in-hospital mortality.

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RESEARCH Open Access

Epidemiology of sepsis in intensive care units in Turkey: a multicenter, point-prevalence study

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Methods: A total of 132 ICUs from 94 hospitals participated. All patients (aged > 18 years) present at the participating ICUs or admitted for any duration within a 24-h period (08:00 on January 27, 2016 to 08:00 on January 28, 2016) were included. The presence of systemic inflammatory response syndrome (SIRS), severe sepsis, and septic shock were assessed and documented based on the consensus criteria of the American College of Chest Physicians and Society of Critical Care Medicine (SEPSIS-I) in infected patients. Patients with septic shock were also assessed using the SEPSIS-III definitions. Data regarding demographics, illness severity, comorbidities, microbiology, therapies, length of stay, and outcomes (dead/alive during 30 days) were recorded.

Results: Of the 1499 patients included in the analysis, 237 (15.8%) had infection without SIRS, 163 (10.8%) had infection with SIRS, 260 (17.3%) had severe sepsis without shock, and 203 (13.5%) had septic shock. The mortality rates were higher in patients with severe sepsis (55.7%) and septic shock (70.4%) than those with infection alone (24.8%) and infection + SIRS (31.2%) ($p < 0.001$). According to SEPSIS-III, 104 (6.9%) patients had septic shock (mortality rate, 75.9%). The respiratory system (71.6%) was the most common site of infection, and *Acinetobacter* spp. (33.7%) were the most common isolated pathogen. Approximately, 74.9%, 39.1%, and 26.5% of *Acinetobacter*, *Klebsiella*, and *Pseudomonas* spp. isolates, respectively, were carbapenem-resistant, which was not associated with a higher mortality risk. Age, acute physiology and chronic health evaluation II score at ICU admission, sequential organ failure assessment score on study day, solid organ malignancy, presence of severe sepsis or shock, *Candida spp.* infection, renal replacement treatment, and a nurse-to-patient ratio of 1:4 (compared with a nurse-to-patient ratio of 1:2) were independent predictors of mortality in infected patients.

Enfeksiyon Hastalıkları Pratiği

1. Uygun ampirik tedavi

2. Direnç gelişiminin en aza indirilmesi
   "Kollateral Hasarın Önlenmesi"

Paterson DL. Clin Infect Dis 2003

Paterson DL. Clin Infect Dis 2004

Ampirik Antibiyotik Seçimi

- Anamnez
- Klinik durum
- Lokal epidemiyoloji

Ampirik Antibiyotik Seçimi

- Hastaya ait faktörler
  - -Enfeksiyonun yeri
  - -Altta yatan hastalık
  - -Kronik organ yetmezliği
  - -Kullandığı ilaçlar
  - -İnvazif işlem ve cihazlar
  - -Bağışıklığın kırılması
  - -İmmünsüpresyon
  - -Dirençli bakteri ile enfeksiyon ya da kolonizasyon
  - -Son 3 ay içinde antibiyotik kullanımı
  - -Enfeksiyon hangi ortamda gelişmiş

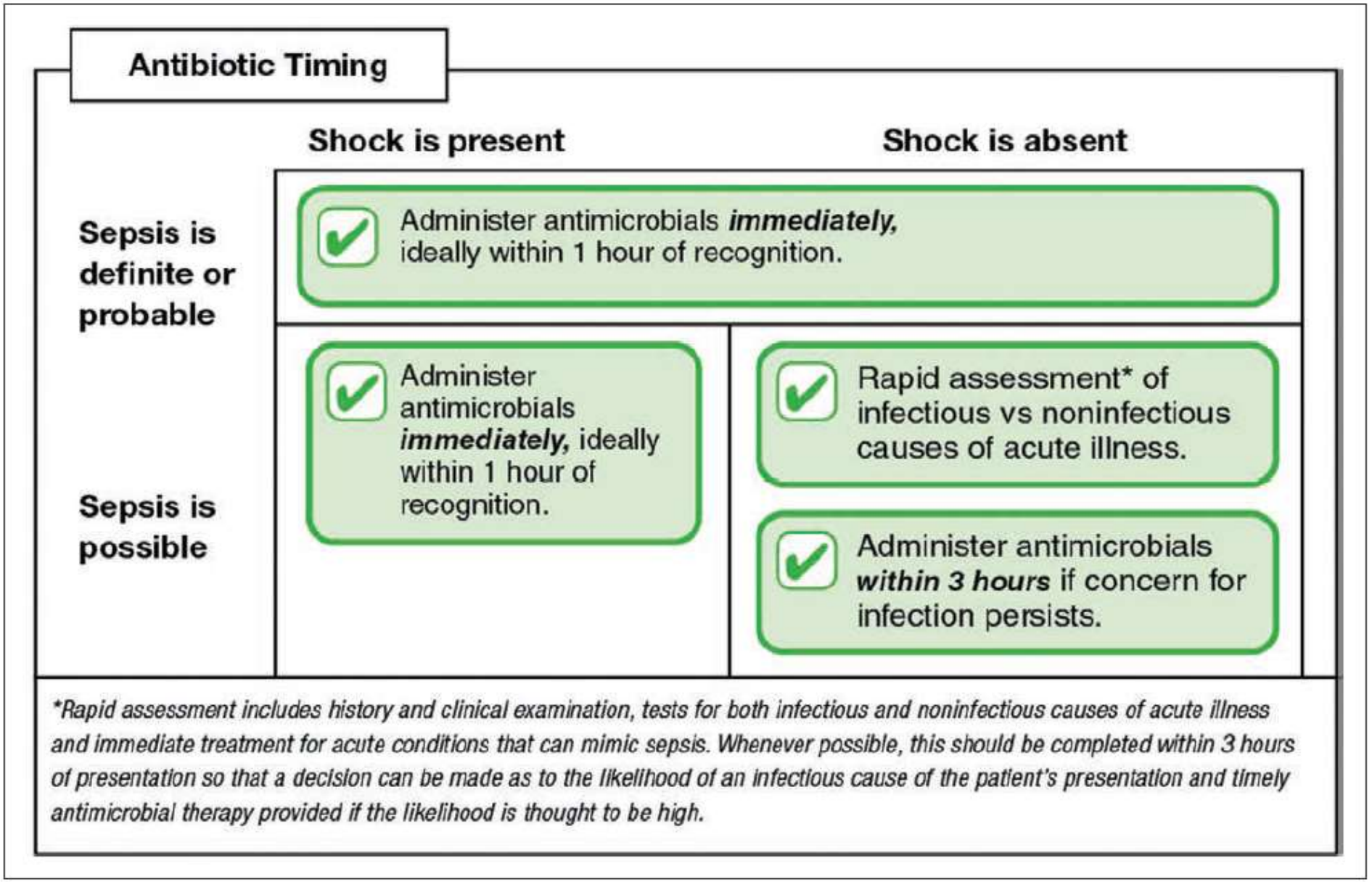

Figure 1. Recommendations on timing of antibiotic administration.

Evans L et al. Crit Care Med 2021

Prokalsitonin

- 1993 yılında sepsis tanısı için bir belirteç olarak tanımlandı
- Protein(116 aminoasid)
- Kalsitonin prehormonu
- Biyolojik fonksiyonu ve indüksiyon mekanizması kalsitoninden farklı
- Normalde tiroid bezindeki C-hücreleri, daha az miktarda nöroendokrin hücreler, akciğer ve ince barsaklardan salınıyor

Prokalsitonin

- Sistemik enflamasyonda, özellikle bakteriyel enfeksiyonlarda akciğer, karaciğer, böbrek ve yağ dokusundan enflamatuvar sitokinler ve endotoksinin indüklediği salınım mevcut
- Sağlıklı kişilerde < 0.05 ng/ml
- Uyarıdan 2-4 saat sonra salınmaya başlıyor
- Tepe düzeyine 6-24 saatte ulaşıyor

Prokalsitonin

- Yarılanma ömrü 24 saat
- Sepsis tanısı, prognozun belirlenmesi ve antibiyotik tedavisinin kesilmesinde yol gösterici

Prokalsitonin Değerlendirmesi

- Enfeksiyon dışı PCT yüksekliği
  - Yanık sonrası
  - Cerrahi sonrası erken dönemde
  - Travma sonrası erken dönemde
  - Sıcak çarpması sonrası
  - Kardiyojenik şok
  - OKT-3 veya ATG uygulanması sonrası
  - Yenidoğanlarda
  - Nöroendokrin tümörlerde