ICU
MANAGEMENT & PRACTICE

Improving antibiotic initiation for sepsis, pre-hospital

Sepsis is a common and costly condition encountered by pre-hospital and emergency department (ED) clinicians. Early antibiotics improve outcomes for septic patients. Researchers from Intermountain Medical Center in Utah led a study to investigate the relationship between septic patients' pre-hospital level of care and ED door-to-antibiotic time.

The study found that care received from emergency medical services (EMS) was associated with decreased door-to-antibiotic times for ED patients with sepsis who did not have hypotension present on ED arrival. The findings suggest possible opportunities to optimise ED care processes to aid delivery of high-quality sepsis care in the emergency department, according to the researchers.

This retrospective cohort study comprised patients admitted from the community to an academic ED between June 2009 - February 2015 with fluid-refractory sepsis or septic shock. Transfer patients and those whose antibiotics began before ED arrival or after ED discharge were excluded. The researchers used multivariable regression to evaluate the association between the time from ED arrival to antibiotic initiation and pre-hospital level of care, defined as the highest level of emergency medical services received: none, basic life support (BLS) ambulance, or advanced life support (ALS) ambulance. They measured variation in this association when hypotension was or was not present by ED arrival.

The research team found:

- Among 361 community-dwelling sepsis patients, the level of pre-hospital care correlated with illness severity.
- ALS-treated patients received antibiotics faster than patients who did not receive pre-hospital care (median 103 [interquartile range 75-135] versus 144 [98-251] minutes, respectively) or BLS-only patients (168 [100-250] minutes, $p<0.001$ for each pairwise comparison with ALS).

The same pattern was observed after multivariable adjustment, such that:

- ALS care (-43 min, [95% CI -84 to -2], $p=0.033$), but not BLS-only care (-4 min [95% CI -41 to +34], $p=0.97$), was associated with less antibiotic delay compared to no pre-hospital care.
- ALS-treated patients more frequently received antibiotics within three hours of ED arrival (91%) compared to walk-in patients (62%, adjusted odds ratio [aOR] 3.11, 95% CI 1.20-8.03, $p=0.015$) or BLS-treated patients (56%, aOR 4.51, 95% CI 1.89-11.35, $p<0.001$).

In addition, ALS-treated patients' antibiotics started faster than walk-in patients in the absence of hypotension by ED arrival (-41 min, [95% CI -110 to -13], $p=0.009$) but not when hypotension was

present (+25 min, [95% CI -43 to +92], p=0.66).

"The fact that ALS care was not associated with more ED triage diagnoses suggestive of sepsis or infection suggests that ALS caregivers did not accelerate antibiotic initiation by priming the ED team to make the diagnosis of sepsis either through pre-hospital diagnosis or through the simple fact of ALS involvement, although these results may be limited due to less detailed triage documentation in patients presenting with higher apparent illness acuity," the authors note. "Rather, the fact that lab draws and sepsis alerts occurred faster after ALS but not BLS-only pre-hospital care suggests triage to ALS but not BLS care resulted in accelerated ED assessment, and therefore accelerated therapeutic decisions for sepsis patients."

Source: Annals of the American Thoracic Society
Image Credit: Pixabay

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