Impact of a Revised Antibiotic Administration Protocol at the emergency department on Time to Treatment and Outcome in Sepsis: A Retrospective Analysis

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OBJECTIVE

This study evaluated the impact of a revised antibiotic administration protocol on outcomes among patients with sepsis and septic shock in the emergency department (ED). Under the previous protocol, emergency physicians were required to obtain approval from an infectious disease specialist before administering certain formulary-restricted antibiotics. The revised protocol granted emergency physicians independent authority to initiate these antibiotics when clinically indicated.

METHODS

We conducted a retrospective analysis of adult patients presenting to the ED with sepsis, severe sepsis, or septic shock between January 2022 and February 2025. The implementation phase of the revised protocol (January–March 2024) was excluded. Data collected included patient demographics, diagnosis, time to antibiotic administration, type of antibiotic administered, and in-hospital mortality. Statistical comparisons were made between pre- and post-protocol groups.

RESULTS

A total of 1,366 patients met inclusion criteria demonstrated in Table 1. Following implementation, the mean time to antibiotic administration decreased as showen in Table 2. The proportion of patients receiving at least one previously restricted antibiotic in the ED increased from 28.5% to 43.8% (χ^2 = 27.3, p<0.001), as illustrated in Figure 1. In-hospital mortality did not differ significantly between periods (39.9% vs. 37.1%, p = 0.358).

Table 1	Before protocol change (N=853)	After protocol change (N=388)	Sig.
Age (years)	77.44 (95%CI 48.75-103)	76.78 (95%CI 48.07-105)	p=0.242
Gender (males)	485 (56.9%)	225 (58%)	p=0.063
Diagnosis (septic shock)	172 (20.2%)	69 (17.8%)	p=0.18
Outcome (died)	340 (39.9%)	144 (37.1%)	p=0.358

Table 2	Before protocol change (N=853)	After protocol change (N=388)	significance
Time to antibiotics (**never restricted**)	84.9 min, 95% CI: 76.05–93.76	92.9 min, 95% CI: 79.93–105.91	p=0.349
Time to antibiotics (**remained restricted**)	102.3 min, 95% CI: 79.54–125.10	86.5 min, 95% CI: 55.78–117.36	p=0.483
Time to antibiotics (**changed protocol**)	120.85 minutes 95% CI: 108.36–133.33	77.37 minutes 95% CI: 66.04–88.67	p<0.001

Figure 1

usage percent - before new protocol: 28.5% new protocol allowed (formerly restricted), 71.5% unchanged

usage percent - after new protocol: 43.8% new protocol allowed (formerly restricted), 56.2% unchanged

CONCLUSIONS

Empowering emergency physicians to initiate antibiotics previously subject to formulary restrictions significantly shortened time.

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