臨床決策輔助系統應用於血流感染治療

Clinical application of CDSS in BSI management

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Bloodstream infection is a severe condition associated with high morbidity and mortality that requires urgent medical intervention. Timely appropriate antimicrobial therapy is crucial management of bloodstream infections and sepsis. The delay in time to appropriate antimicrobial therapy (TAAT) among patients with sepsis and bloodstream infections is associated with an unfavorable outcome. A clinical decision support system (CDSS) is designed to improve healthcare delivery by optimizing medical decisions. CDSS is also used in antimicrobials prescription, from assisting antimicrobial stewardship programs, optimizing antimicrobial choice and dosing, to compliance with guidelines.

Kaohsiung Veterans General Hospital implemented a hospital-wide, active-delivery, automatic CDSS in 2020. This CDSS was designed to help detect antimicrobial-pathogen mismatches among hospitalized patients with bloodstream infections. Once a mismatch was detected, the system sent a real-time alert text message to in-charge clinicians. In this talk, I will introduce this CDSS to the audience, and show the impact of this CDSS on the reduction of TAAT.

Before the implementation of this CDSS, the median time from culture report to appropriate antimicrobial prescription was 2.45 hours. After the implementation, the overall median TAAT decreased significantly (from 2.45 to 1.65 hours, $p < 0.001$). The decrease is especially remarkable outside working hours (6.43 to 1.24 hours, $p < 0.001$), in the medical wards (2.14 to 1.40 hours, $p < 0.001$), in patients with candidemia (5.36 to 0.74 hours, $p < 0.001$), and in non-MDRO bacteremia (2.49 to 1.66 hours, $p < 0.001$).

To conclude, using a knowledge-based CDSS to reduce TAAT in a real-world scenario is feasible and effective. Not every physician is familiar with the spectrum of antimicrobial agents and their activity against various pathogens. A well-designed CDSS may play a role in assisting clinicians with the early detection of antimicrobial-pathogen mismatches.