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Abstract (oral session)

**Impact of automated alerts on time to appropriate therapy among patients with Gram-negative bacteraemia**

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**Objectives:** Time to Appropriate Therapy (TTAT) is an important modifiable risk factor for mortality among patients with sepsis due to Gram-negative bacilli (GNB). Strategies to improve the timely implementation of appropriate antimicrobial therapy are clinically warranted. TheraDoc® is an electronic data capture system that has the ability to send real-time alerts to clinicians via email or electronic page when culture information is updated. The objective of this study was to assess if TheraDoc® could be utilized to decrease TTAT and improve outcomes of patients with GNB. **Methods:** This was a retrospective case-control study performed at the Detroit Medical Center (DMC). The control group consisted of patients with Gram-negative bacteremia in 2009 prior to implementation of TheraDoc®. The case group consisted of patients with GNB from December 2010 through August 2011, after TheraDoc® had been implemented. During the case group period, each time blood culture result for GNB was update by the microbiology laboratory, a page was immediately sent to antimicrobial stewardship pharmacists with updated information. Pharmacists then made antimicrobial recommendations to providers based on culture results, institutional guidelines and clinical data. **Results:** 38 cases and 108 controls were studied. The groups were well matched for baseline characteristics with the exception of more patients in the case group having COPD (29% vs 14%  $p = 0.04$ ), while control patients had higher Pitt bacteremia scores (PBS) (2.0 (IQR 1-3) vs 1.0 (IQR 0-2)). In the majority of patients in both groups, the urine (40%) was the primary source of infection; and the most common GNB pathogen was Eschericia coli (36%). Compared to controls, case patients experienced a significantly shorter delay in receipt of effective therapy, as measured from the time culture was initially positive for GNB to the time of receipt of effective therapy ( $p = 0.014$ ) (Table). Cases had a significantly decreased duration of bacteremia ( $p = 0.02$ ) and shorter duration of hospitalization after bacteremia ( $p = 0.001$ ). **Conclusions:** Automated alerts were used to significantly decrease the time to receipt of effective antimicrobial therapy by a mean of 3.6 hours. The improved timeliness of implementation of effective antimicrobial therapy was associated with a decrease in duration of hospitalization of more than 3 days.

	Case (n = 38)	Control (n = 108)	P value
Median number of hours from time culture was drawn to time of receipt of effective therapy (IQR)	4.0 (2-28)	12.0 (1-35)	0.79
Median and mean number of hours from time of culture positivity to receipt of effective therapy	Median: 0.0 (0 – 0) Mean: 8.8 ± 23.0	Median: 0.0 (0 - 11) Mean: 12.4 ± 23.1	0.014
Median duration of hospitalization	8.5 (5-14)	12 (7-22)	0.09
Median duration of hospitalization from time of bacteremia to discharge	6 (4-11)	10 (6-19)	0.001
Median and mean duration of hospitalization in intensive care unit	Median: 0 (0-0) Mean: 1.4 ± 4.6	Median: 0 (0-6) Mean: 6.9 ± 15.3	0.02
Median number of days with fever	1 (0-2)	1 (0-3)	0.19
Median and mean duration of bacteremia	Median: 1 (1-2) Mean; 1.2 ± 0.75	Median: 1 (1-1) Mean; 1.88 ± 1.76	0.02
Number of patients with 30 day mortality (%)	8 (21)	20 (19)	0.74