Poster #912

Impact of rapid identification and stewardship intervention on coagulase-negative Staphylococcus bloodstream infection



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Fig. 1: Algorithm Developed for Management of CoNS Blood Cultures



Definitions adopted from Holland et al., JAMA. 2018;320(12):1249-1258 CoNS: coagulase-negative Staphylococcus; S/S: signs or symptoms; BSI: bloodstream infection; ID: Infectious Disease; CVC: central venous catheter

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Complicated bacteremia

- **Repeat** 2 sets of peripheral blood
- Further workup, duration as clinically

Uncomplicated bacteremia

- **Duration**: up to 5 days of therapy

- contaminants and do not require treatment
- healthcare resources

- independent time periods:
- Pre-RDT implementation (Nov. 2019 Feb. 2020)
- Post-RDT implementation (Nov. 2020 Feb. 2021)
- from 6a 10p

- significant (two-tailed)

Fig 2: Patient Demographics and Clinical Characteristics



INTRODUCTION

Coagulase-negative staphylococci (CoNS) are the most common organism isolated from blood cultures; most cases are considered

• Treatment of CoNS blood culture contaminants consumes significant

 Management guidelines for CoNS bacteremia have not been developed which contributes to variable approaches by pharmacists and physicians

• Prior studies attempting to optimize treatment of CoNS BSI have been limited by conventional laboratory techniques, resulting in delayed organism identification and prolonged durations of empiric therapy

• In this study, we aimed to measure the impact of rapid diagnostic testing with the GenMark ePlex and implementation of early antimicrobial stewardship intervention on management of CoNS positive blood cultures

METHODS

Blood cultures with non-*lugdunensis* CoNS were identified during 3

• Post-RDT w/ ASP algorithm (Dec. 2021 – Mar. 2022)

In both post-RDT time periods, results were called directly to the antimicrobial stewardship (ASP) team; results were available in real-time

Results from 10p – 6a were called in to the ASP the following morning

During the prospective implementation phase cases were classified in real-time by ASP personnel as outlined in the algorithm (Figure 1)

Categorical and continuous variables were compared by chi-squared and Mann-Whitney U tests, respectively. A P-value <0.05 was considered

ole	Pre-RDT (n=65)	Post-RDT (n=60)	RDT + ASP (n=57)
n (%)	35 (54%)	34 (57%)	29 (51%)
an age	57	61	65
n (%)	4 (6.2%)	5 (8.3%)	6 (10.5%)
) , n (%)	1 (1.6%)	2 (3.3%)	2 (3.5%)
an Charlson score e)	4 (0 - 11)	4 (0 - 11)	5 (0 - 15)
an Pitt Bacteremia score e)	3 (0 - 14)	3 (0 - 14)	3 (0 - 14)
idermidis, n (%)	55 (85%)	41 (68%)	44 (77%)
e bottle positive, n (%)	41 (63%)	41 (68%)	43 (75%)

RDT: rapid diagnostic testing

ASP: algorithmic antimicrobial stewardship program intervention

SOT: solid organ transplant **PWID**: person who injects drugs

Fig. 3: Outcomes							
67 – 86% of cases were classified as "simple" bacteremia across the three cohorts	Pre-RDT (n=65)	Post-RDT (n=60)	RDT+ASP (n=57)				
Outcome	Simple-low Simple-mod Pre-RDT	Simple-high Une Post-RDT	complicated Complicated RDT+ASP	P-value*			
Empiric therapy avoided, n (%)	8 (12%)	11 (18%)	16 (28%)	0.04			
Tx <24 hours, n (%)	20 (31%)	21 (35%)	31 (54%)	0.006			
Median BSI DOT Simple Uncomplicated Complicated 	1.1 10.8 9.5	1.2 3.5 21.7	0.00 4.8 23.5	0.003 0.53 0.37			
Recurrent BSI, n (%) [†]	3 (4.9%)	1 (1.9%)	0 (0%)	0.19			
AKI attributed to vancomycin ^{††}	5 (7.7%)	4 (6.7%)	3 (5.3%)	0.63			
30-day Readmission, n (%) ⁺	15 (25%)	10 (20%)	8 (17%)	0.49			
Infectious Disease consult	36 (55%)	33 (55%)	27 (47%)	0.33			
Pharmacokinetics consult	_	42 (70%)	44 (77%)	0.38			
Echocardiogram performed	23 (35%)	24 (40%)	17 (30%)	0.31			
Median LOS from index culture [†]	10	10.5	7	0.10			
*Pre- and post-RDT were compared to RDT + ASP. Medians were compared with Mann Whitney U test, and rates with Chi-square. [†] Patients who died during index hospitalization excluded from calculation ^{††} Includes patients who developed AKI by KDIGO criteria after receiving vancomycin for ≥ 48 hours. LOS: length of stay							
RESULTS							
During pre- and post-RDT periods median days of antibiotic therapy did							

- During pre- and post-RDT periods, median days of antibiotic therapy did not vary significantly for patients with simple BSI (1.1 vs 1.2)
- Median days of therapy were significantly reduced (P=0.003) for simple CoNS BSI in the prospective RDT + ASP period
- 54% of patients with CoNS BSI received <24 hours of therapy in the RDT+ASP time period compared to 33% (P=0.006) in the combined pre-RDT and post-RDT periods
- Treatment was entirely avoided in 28% of CoNS BSI cases in the RDT+ASP period compared to 15.5% in other periods (P=0.04)
- 7 cases classified as simple were reclassified as uncomplicated or complicated after further workup
- Rates of recurrent BSI and 30-day readmission were comparable across time periods

- **RDT** without standardized **ASP** recommendations did not reduce rates of antibiotic use
- Our results demonstrate that the combination of RDT and algorithmbased ASP intervention significantly reduces overall antibiotic therapy and increases antibiotic avoidance for CoNS BSI
- These data attest to the safety and efficacy of early ASP intervention for patients with CoNS BSI identified through RDT at the time of positive blood cultures

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CONCLUSIONS

 We developed an innovative protocol to guide and standardize the management of CoNS BSI using both RDT and ASP intervention