Impact of Accelerate Pheno System in Management of Gram-Negative Rod Bacteremia

Iaswarya Ganapathiraju, DO[1]; Amanda Bushman, PharmD[2]; Rossana Rosa, MD[3]

BACKGROUND

- Early pathogen identification and appropriate antimicrobial therapy is key in management of gram-negative rod (GNR) blood stream infection.
- Accelerate Pheno System (AxDx) has been shown to reduce time to organism identification compared to traditional culture-based methods.

OBJECTIVE

- Determine impact of AxDx on timely management of blood stream infection with *Enterobacterales* within the context of low antimicrobial resistance and a well-established Antimicrobial Stewardship Program.

METHODS

- Retrospective cohort study, conducted within 3 hospitals part of an integrated health system, from February 18, 2019 to February 29, 2020.
- Adult hospitalized patients with blood stream infection due to *Enterobacterales.*
- Exclusion criteria: Death or hospice within 48 hours of blood culture collection.
- Primary outcomes: Change in therapy within 48 hours of blood culture collection, length of hospital stay, and in-hospital mortality.
- Categorical variables compared by Chi-square and Fisher-exact test. Logistic regression models used to calculate odds ratio for impact of intervention on therapy optimization.

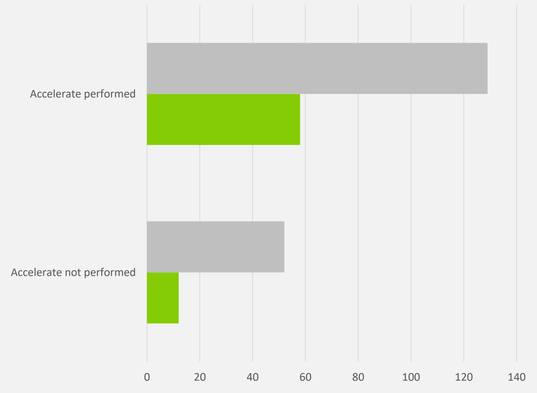
RESULTS

- 239 unique patients were identified, and 251 bacteremia episodes. No significant difference in baseline characteristics (Table 1).
- Among patients on whom AxDx was performed, 12/64 (18.8%) underwent de-escalation within 48 hours of blood culture collection, compared to 58/187 (31.0%). Patients on whom AxDx was performed had 95% higher odds of de-escalation at 48 hours, but this difference was not statistically significant (95% CI 0.97-3.92; *p*=0.07*)* (Figure 1).
- Escalation of therapy within 48 hours was done in 11/64 (17.2%) of patients on whom AxDx was not performed compared to 32/187 (17.1%) on whom AxDx was performed (*p*=0.99)
- No statistically significant differences in-hospital mortality (4.7% vs 6.4%) or length of stay (5.8 vs 5.1) among patients without AxDx not performed vs AxDx performed respectively were found.

Table 1: Demographic characteristics

	Accelerate not performed N=62(%)	Accelerate performed N= 177(%)	*P*-value
Age (median)	70 (65-81)	71 (63-83)	0.92
Female sex	37 (59.6)	112 (63.3)	0.89
Pitt Bacteremia Score (median)	0 (0-1)	0 (0-2)	0.19
ICU level of care	16(25.1)	39(22.0)	0.54
Source of bacteremia			0.58
Genitourinary	34(54.8)	110 (62.2)	
Gastrointestinal	19 (30.6)	38 (21.5)	
Central line BSI	0	2 (1.1)	
Other	5 (8.1)	17 (9.6)	
Unknown	4(6.5)	10 (5.6)	

Figure 1: Percentage of patients who underwent change in therapy within 48 hours



CONCLUSION

- In hospitals with baseline short length of stay, low levels of antimicrobial resistance and a well-established Antimicrobial Stewardship Program, use of the Accelerate Pheno System was associated with a trend towards increase in de-escalation at 48 hours from blood culture collection. However, there was no impact on escalation of therapy, hospital length of stay or in-hospital mortality.

UnityPoint Health Des Moines

[1]University of Iowa – Des Moines Internal Medicine Residency, Des Moines, IA; [2]Department of Pharmacy, UnityPoint Health, Des Moines, IA; [3] Infectious Diseases Service, UnityPoint Health, Des Moines, IA

Contact: Iaswarya.Ganapathiraju@unitypoint.org

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