Proportional comparison of the Gram-negative bacterial species identified in patients with recurrent and non-recurrent bloodstream infections.

**Conclusion.** Recurrent GNB-BSI is an uncommon complication of GNB-BSI. Recurrent GNB-BSI is most often driven by relapse, as opposed to reinfection, and is associated with black race, implanted cardiac devices and admission to surgical service.

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60. Creation and Comparison of a Machine Learning Decision Tree and Traditional Risk Score to Predict Ceftriaxone Resistance in Cancer Patients with *E. coli* Bacteremia

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**Session:** O-13. GNB bacteremia

**Background.** There are several clinical tools that have been developed to predict the likelihood of extended-spectrum β-lactamase producing *Enterobacteriaceae*; however, the creation of these tools included few patients with cancer or otherwise immunosuppressed. The objectives of this retrospective cohort study were to develop a decision tree and traditional risk score to predict ceftriaxone resistance in cancer patients with *Escherichia coli* (*E. coli*) bacteremia as well as to compare the predictive accuracy between the tools.

**Methods.** Adults age ≥ 18 years old with *E. coli* bacteremia at The University of Texas MD Anderson Cancer Center from 1/2018 to 12/2019 were included. Isolates recovered within 1 week from the same patient were excluded. The decision tree was constructed using classification and regression tree analysis, with a minimum node size of 10. The risk score was created using a multivariable logistic regression model derived by using stepwise variable selection with backward elimination at level 0.2. The decision tree and risk score statistical metrics were compared.

**Results.** A total of 629 *E. coli* isolates were screened, of which 580 isolates met criteria. Ceftriaxone-resistant (CRO-R) *E. coli* accounted for 36% of isolates. The machine-learning-derived decision tree included 5 predictors whereas the logistic regression-derived risk score included 7 predictors. The risk score cutoff point of ≥ 5 points demonstrated the most optimized overall classification accuracy. The positive predictive value of the decision tree was higher than that of the risk score (88% vs 74%, respectively, but the area under the receiver operating characteristic curve and model accuracy of the risk score was higher than that of the decision tree (0.85 vs 0.73 and 82% vs 74%, respectively).

**Conclusion.** The decision tree and risk score can be used to determine the likelihood of whether a cancer patient with *E. coli* bacteremia has a CRO-R infection. In both clinical tools, the strongest predictor was a history of CRO-R *E. coli* colonization or infection in the last 6 months. The decision tree was more user-friendly, has fewer variables, and has a better positive predictive value in comparison to the risk score. However, the risk score has a significantly better discrimination and model accuracy than that of the decision tree.

**Disclosures.** Samuel L. Aitken, PharmD, MPH, BCIDP, Melinta Therapeutics (Individual(s) Involved: Self); Consultant, Grant/Research Support

61. Short- versus prolonged-courses of antimicrobial therapy for patients with uncomplicated *Pseudomonas aeruginosa* bloodstream infection

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**Session:** O-13. GNB bacteremia

**Background.** The optimal duration of antimicrobial therapy for uncomplicated *Pseudomonas aeruginosa* bloodstream infection (BSI) is unknown. We compared the outcomes of short and prolonged courses of antimicrobial therapy in adults with uncomplicated pseudomonal BSI.

**Methods.** All patients with uncomplicated *P. aeruginosa* BSI admitted at a tertiary-care hospital from May 2016 to September 2020 were included. We compared the rate of recurrent *P. aeruginosa* infection and 30-day mortality among patients who underwent short (7-11 days) and prolonged (12-21 days) courses of antimicrobial therapy using propensity score analysis with the inverse probability of treatment weighting (IPTW) method.

**Table 1. Regression Model and Assigned Points for Clinical Risk Score**

| Variable                      | Odds Ratio (95% CI) | Assigned Points |
|-------------------------------|--------------------|-----------------|
| Ceftriaxone-resistant E. coli colonization or infection in the last 6 months | 10.62 (2.90-39.12) | 11              |
| Ceftriaxone-resistant E. coli colonization or infection in the last 6 months | 4.61 (1.75-11.98)  | 6               |
| Long-term care facility (in the last 6 months) | 4.95 (1.71-14.66)  | 5               |
| Hospitalization in the last 6 months | 2.00 (1.61-4.45)  | 3               |
| AKI/5000 pack days | 2.00 (1.49-4.32)  | 2               |
| Pseudomonas infection source: genitourinary system | 2.06 (1.42-3.30)  | 2               |

**Table 2. Statistical Metrics of Clinical Decision Tree and Clinical Risk Score**

|                | Decision Tree | Risk Score |
|----------------|--------------|------------|
| Number of variables | 5            | 7          |
| Sensitivity, % | 54%          | 97%        |
| Specificity, % | 67%          | 92%        |
| Positive predictive value, % | 80%         | 74%        |
| Negative predictive value, % | 71%          | 76%        |
| Area under the receiver operating characteristic curve | 0.73        | 0.85       |

**Conclusion.** The decision tree and risk score can be used to determine the likelihood of whether a cancer patient with *E. coli* bacteremia has a CRO-R infection. In both clinical tools, the strongest predictor was a history of CRO-R *E. coli* colonization or infection in the last 6 months. The decision tree was more user-friendly, has fewer variables, and has a better positive predictive value in comparison to the risk score. However, the risk score has a significantly better discrimination and model accuracy than that of the decision tree.

**Disclosures.** Samuel L. Aitken, PharmD, MPH, BCIDP, Melinta Therapeutics (Individual(s) Involved: Self); Consultant, Grant/Research Support

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