Table. Four patient room drain CPE isolates (D1h, D4, D5, D12) and isolates from prior room occupants that they were related to whole-genome sequencing.

| Isolate | Species and sequence type (ST) | Isolate | Species and sequence type (ST) | Isolate | Species and sequence type (ST) | Isolate | Species and sequence type (ST) |
|---------|--------------------------------|---------|--------------------------------|---------|--------------------------------|---------|--------------------------------|
| D1h     | K. oxytoca ST474              | D4      | K. oxytoca ST474              | D5      | K. oxytoca ST474              | D12     | K. oxytoca ST474              |
| D12     | K. oxytoca ST474              |         |                                |         |                                |         |                                |
|         |                                |         |                                |         |                                |         |                                |
| R1a     | C. freundii ST474             | R1b     | C. freundii ST474             | R2      | C. freundii ST474             | R11     | C. freundii ST474             |
| R2      | C. freundii ST474             |         |                                |         |                                |         |                                |
|         |                                |         |                                |         |                                |         |                                |
| E1      | K. pneumonia ST474            | E2      | K. pneumonia ST474            | E5      | K. pneumonia ST474            | E11     | K. pneumonia ST474            |
| E2      | K. pneumonia ST474            |         |                                |         |                                |         |                                |

Table 2. Univariate Analysis of Patient Characteristics Comparing ESBL-positive and ESBL-negative Culture Positive Subsequent Infections

| Factor              | Culture Positive SI | ESBL (n=18) | ESBL (n=22) | p-value |
|---------------------|----------------------|-------------|-------------|---------|
| Age, years          |                      | 67          | 60          | 0.091   |
| Male                |                      | 71 (71%)    | 37 (77%)    | 0.009   |
| Immunosuppressed    |                      | 0 (0%)      | 3 (7%)      | 0.700   |
| Chronic Comorbidity Index Scores, mean (SD) | 15.1 (12.0) | 25.8 (12.0) | 0.008 |
| History of ESBL IC  |                      | 22 (100%)   | 18 (82%)    | 0.005   |
| Days between IC and SI, mean (SD) | 35 (14-66) | 140 (95-363) | 0.014 |
| Antibiotics Inhaled prior to SI, mean (SD) | 37 (0-17) | 25 (0-80) | 0.127 |

Data presented as n (%) unless indicated otherwise.

Figure 1. Cumulative rate of ESBL-positive SI in 180 days (6 months) following IC

Table 1. Index Culture Characteristics of Culture Positive Subsequent Infections

| Index Culture | Culture Positive SI | ESBL-positive (n=22) | ESBL-negative (n=41) |
|---------------|---------------------|----------------------|----------------------|
| ESBL-positive (n=20) |                      | 22 (100%)            | 10 (48%)             |
| ESBL-negative (n=10)  |                      | 10 (50%)             | 21 (51%)             |

Data presented in %

838. Drivers of empiric carbapenem use: How important is history of extended-spectrum beta-lactamase (ESBL) infection?

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Session: P-36. HAI: Gram-negatives (MDR-GNR)

Background. CARs are first line agents for serious infections caused by ESBL producers. Likelihood of developing subsequent ESBL infection is unknown. In patients (pts) with a history (hx) of ESBL positive (ESBLP) culture, empiric therapy with a CAR has become common in hospitals. The purpose of this study was to evaluate the microbiology of subsequent infections (SI) among pts with hx of ESBL culture and determine risk factors associated with ESBLP SI that may justify an empiric CAR.

Methods. This retrospective observational study was conducted at a multicenter health system. The electronic medical record (EMR) was used to generate a report of all E. coli (EC) or K. pneumoniae (KP) ESBL cultures during 2017, an analogous report was generated for ESBL-negative (ESBLN) EC or KP. These were termed index cultures (IC). Pts were randomly selected from each report until 200 total pts were enrolled. Inpatients, outpatients, and all culture specimens were included. Pts with an ESBL culture prior to 2017 were excluded. The EMR was reviewed up to 1 year after the IC. Pt and culture characteristics were recorded. The primary outcome was proportion of pts who developed an ESBLP SI. Risk factors associated with ESBLP SI were determined. Relapsed infection (same site, same organism that occurred within 2 weeks of the IC) was excluded.

Results. 200 pts were included, 100 with ESBLP IC and 100 with ESBLN IC. The mean age was 58 years, 84% were female, and 69% were outpatients. 86% of IC were EC and 86% were urine specimens. Within 1 year of IC, 100 pts (50%) developed a SI. Risk factors associated with ESBLP SI were determined. Relapsed infection (same site, same organism that occurred within 2 weeks of the IC) was excluded.

Conclusion. It was uncommon for drain CPE to be linked to prior patient exposure. This suggests contamination of most drains by undetected colonized patients and a need for more aggressive patient screening in our hospitals. This may also suggest retrograde (drain-to-drain) transmission, especially considering the 10 isolate drain clusters at one hospital. Reasons for the preponderance of ESBL-producing Enterobacteriaceae in hospitals. The purpose of this study was to evaluate the microbiology of subsequent infections (SI) among pts with hx of ESBL culture and determine risk factors associated with ESBLP SI that may justify an empiric CAR.

Disclosures. Allison McGeer, MD, FRCPC. GlassoSmithKline (Advisor or Review Panel member, Research Grant or Support) McKer (Advisor or Review Panel member, Research Grant or Support) Pfizer (Research Grant or Support) Elizabeth Palavecino, MD, Paratek (Grant/Research Support) Elizabeth Palavecino, MD, Paratek (Grant/Research Support) John Williamson, PharmD, Paratek (Research Grant or Support)

839. Epidemiology of Extended-Spectrum Beta-lactamase (ESBL) Producing Enterobacteriaceae in the South East Tennessee, October December 2017

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Session: P-36. HAI: Gram-negatives (MDR-GNR)

Background. The increasing spread of drug resistant gram-negative organisms is one of the major public health challenges. ESBL-producing Enterobacteriaceae has become the most common multi drug resistant pathogen in the last three decades. These organisms confer resistance to most beta-lactam antibiotics, including penicillins, third generation cephalosporins, monobactams and tazobactam. The Tennessee Department Health (TDH) collaborated with CDC to pilot population based surveillance of ESBL producing organisms in Maury, Wayne, Lewis and Marshall Counties during October to December 2017. A case was defined as isolation of Escherichia coli, Klebsiella pneumoniae, or Klebsiella oxytoca resistant to at least one extended-spectrum cephalosporin (ceftazidime, cefotaxime or ceftriaxone) and non-resistant to all carbapenem antibiotics from urine or normally sterile body sites from a resident of the surveillance catchment area. A line list of ESBL-producing organisms was received from the labs that serve the catchment population. Case report forms were completed for the first ESBL culture collected from a single patient in a 30 day period.

Results. A total of 154 cases were identified during the study period. E.coli constitutes 92.2% of the ESBL producing organisms followed by Klebsiella pneumoniae (5.2%) and K. oxytoca (2.6%). The estimated annual incidence rate was 404.7 per 100,000 population which is more than twice of the average rates of other sites that conducted similar studies. The most common isolate source was urine (97%), and 81.2% of all cases were female. Patient ages ranged from 3-99 years, with average of 67 years. Thirty-two isolates underwent additional sequence typing and 76.7% (23) of the isolates were ST 131. 21 (91.3%) of ST-131 isolates were resistant to ciprofloxacin. It was uncommon for drain CPE to be linked to prior patient exposure.

Conclusion. The incidence of ESBL producing organisms is very high in the Tennessee study area compared to other sites. The most common ESBL-producing pathogen was found to be ST 131 and most of these were resistant to ciprofloxacin suggesting that resistance to fluoroquinolone may be co-transmitted in ESBL producing pathogens through plasmids. Continued surveillance of molecular epidemiology is important to guide the prevention of the spread of drug resistant pathogens.

Disclosures. All Authors: No reported disclosures