In January 2018, the first case of an OXA-48 carbapenem-resistant Klebsiella pneumoniae (OXA-48 CRKP) was identified in a North Carolina hospital in a patient arriving from Eastern Europe. Over the next year across multiple inpatient adult units, 14 patients had clinical isolates and 2 patients had positive rectal surveillance screens for OXA-48 CRKP.

Methods. Investigation activities to characterize the OXA-48 CRKP epidemiology included: >1000 rectal colonization screens of epidemiologically linked patients, chart reviews of infected and colonized patients, hand hygiene and environmental cleaning observations on affected units, environmental sampling to include endoscopes, sinks and toilets, and molecular analyses (pulsed-field gel electrophoresis and whole-genome sequencing).

Results. Molecular analyses confirmed a clonal outbreak. All environmental cultures including endoscope cultures performed were negative for OXA-48 CRKP. All cases were explained by at least one of three mechanisms: (1) time/space overlap on the same unit (presumed lack of hand hygiene or contamination of shared patient equipment), (2) patient housed in room where previously infected patient was housed (presumed inadequate terminal disinfection/contaminated environment), or (3) a single upper gastrointestinal endoscope. Interventions included surveillance to identify and isolate colonized patients, discharge room cleaning of OXA-48 CRKP patients enhanced by ultraviolet light disinfection, curtain laundering, and discarding unused patient supplies. Facilities to determine compliance and feedback for compliance with hand hygiene, cleaning, and use of personal protective equipment. A single endoscope used between multiple OXA-48 CRKP patients with no other known transmission link was quarantined upon identification, sterilized with ethylene oxide, and ultimately placed out of service.

Conclusion. A clonal outbreak of a novel carbapenemase-producing Enterobacteriaceae likely spread via multiple modes of transmission. The investigation was complicated by infrequent identification of colonization among patients epidemiologically linked to known cases. Multiple interventions based on epidemiological links were necessary to halt hospital-wide transmission.

Disclosures. All authors: No reported disclosures.

530. Sequential Screening of High-Risk Patients for Carbapenemase-Producing Enterobacteriaceae Colonization

Background. Early identification of patients colonized with carbapenemase-producing Enterobacteriaceae (CPE) facilitates the implementation of appropriate infection control measures and reduces nosocomial transmission. Sequential screening for CPE colonization of close contacts of known cases is recommended. Fraser Health (FH) expanded sequential screening to patients with recent exposure to other risk factors following the identification of CPE in patients who initially screened negative.

Methods. FH screens patients for CPE who report healthcare outside of Canada or travel to endemic countries within the previous 12 months. Patients remain on contact precautions and are re-screened 7 and 21 days after the last known exposure date. We reviewed CPE cases with foreign healthcare or travel to endemic countries who screened negative on admission but subsequently screened positive within 30 days. Patients without confirmation of colonization through a rectal screen or possible exposure to a current nosocomial source were excluded. Whole-genome sequencing results were examined to confirm foreign healthcare or travel as the likely source of acquisition. Medical records were reviewed to obtain patient history and clinical details.

Results. Between November 2015 and January 2019, 21 patients had a positive CPE screen within 30 days of a negative screen, with no known CPE exposures during that time. The median time between the last date of known exposure and positive CPE screen was 20 days (range: 7–77 days). Twelve (57%) cases were hospitalized outside of Canada. Eight (38%) reported other foreign healthcare encounters, and 1 (5%) had no reported healthcare outside of Canada but had travelled to an endemic country. Sixteen (71%) cases received antibiotics prior to the positive CPE screen.

Conclusion. Patients with unrecognized CPE colonization are a source for nosocomial transmission. Patients screening negative for CPE with recent exposure to risk factors other than contact with a known case may screen positive at a later date. This may be due to higher colonization levels or antibiotic selection pressures. Surveillance of colonization is recommended with a rectal screen possible 3–5 days after the end of SBST. Data were retrieved from the hospital electronic database. Cases with three consecutive weekly negative screens were considered to be decolonized. CPE were processed according to CDC protocol briefly, the swab was inoculated into 10 mL of trypticase soy broth (Becton, Dickinson and Co, Sparks, MD) and incubated at 35°C for 48 h. The next day, after vortexing, 100 µL of the inoculum was subcultured (8) onto chromID CARBA agar plates (bioMérieux) and incubated at 35°C for 18–20 h. Three to four colonies were processed according to the VITEK MS system (bioMérieux). The zone isolates was performed with the VITEK 2 system (bioMérieux). Isolates were tested for their resistance phenotypes to imipenem, eteperpenam, and meropenem by E-test (bioMérieux). The results were interpreted according to the EUCAST criteria.

Results. Fifteen cases (2 women, mean age 60.6 ± 18.3 [min. 18–max. 83]) fulfilled the inclusion criteria. All had a history of carbapenem usage. Five cases (33%) had three consequent negative CPE before SBST and were considered to be decolonized. Two cases on chronic antibiotic during colonization were decolonized (trimethoprim-sulfamethoxazole and metronidazole). Three cases who received no concomitant antibiotic were decolonized.

Conclusion. SBST may be a promising tool for decolonizing CPE carriers. These data need to be validated in larger cohorts preferably via randomized-controlled trials.

Disclosures. All authors: No reported disclosures.

531. Practical and Evidence-Based Considerations for Implementation of Bacterial Whole-Genome Sequencing Within Longitudinal Infection Control Practice

Background. Whole-genome sequencing (WGS) of bacteria is becoming a routine tool to guide infection control (IC) practice and is longitudinally underexplored. As with any technology adopted in the hospital, the integration of WGS into IC practice must be carefully managed and considered. We qualitatively report an evidence-based implementation workflow that considers WGS to proactively guide IC professionals during investigation of infectious outbreaks.

Methods. We built upon lessons learned in an ongoing surveillance effort at a tertiary care hospital—utilizing retrospective WGS data within the Philips IntelliSpace Epidemiology system—to understand facilitators and barriers to the use of bacterial WGS longitudinally to inform IC workflow. Our team established a 9-month workgroup to study the practical aspects of implementing WGS in routine IC practice. From expert opinion collected via the workgroup, in addition to evidence from the literature, a workflow guidance document and checklist was codified. New ideas included incorporating education to promote the establishment of an IC triage process.

Results. The workflow includes five stages: recognizing and responding to an outbreak, early alerting of relevant stakeholders, utilizing bacterial WGS for targeted investigation to guide IC practice, qualitatively report an evidence-based implementation workflow that considers WGS to proactively guide IC professionals during investigation of infectious outbreaks.

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