PSEUDO-OUTBREAK OF *CLOSTRIDIOIDES (CLOSTRIDIUM) DIFFICILE* AMONG POSTOPERATIVE ONCOLOGY PATIENTS

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BACKGROUND

- *Clostridioides difficile* infection (CDI) is the most common causative pathogen in healthcare-associated infections
- In a single institution, an outbreak suggests bacterial spread among individuals at that institution, whereas a cluster/pseudo-outbreak denotes a greater-than-expected number of infections arising from unrelated causative strains
- The majority of CDI in hospitalized patients are genetically distinct, implying substantial community-based colonization/transmission
- Whole genome sequencing (WGS) first used in 2012 to investigate hospital CDI, now a preferred method but not widely available

OBJECTIVES

- To test the extent to which a suspected outbreak of CDI based on CDC criteria among surgical oncology patients represented patient-to-patient transmission
- To evaluate the value of WGS in distinguishing an outbreak from a cluster of CDI

METHODS

- Single-institution retrospective cohort study of surgical oncology patients diagnosed with CDI on one of two nursing wards at Roswell Park Comprehensive Cancer Center between June –November, 2019
- Samples from all CDI patients submitted for WGS
  - WGS performed with Illumina MiSeq instrumentation
  - DNA library prepared by Illumina Nextera XT DNA Library protocol
- Assembly and core genome multilocus sequence typing analysis performed with Ridom SeqSphere+ software
- Primary chart review performed of CDI patients
- Cases classified as community- vs. hospital-acquired/associated using National Healthcare Safety Network definitions

RESULTS

Figure 1. Creation of cohort and subdivision by WGS results.

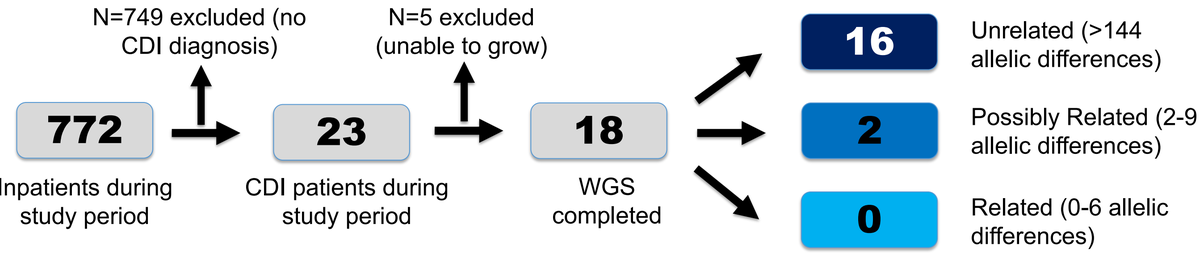


Figure 2. Distribution of CDI (N=23) by month of diagnosis.

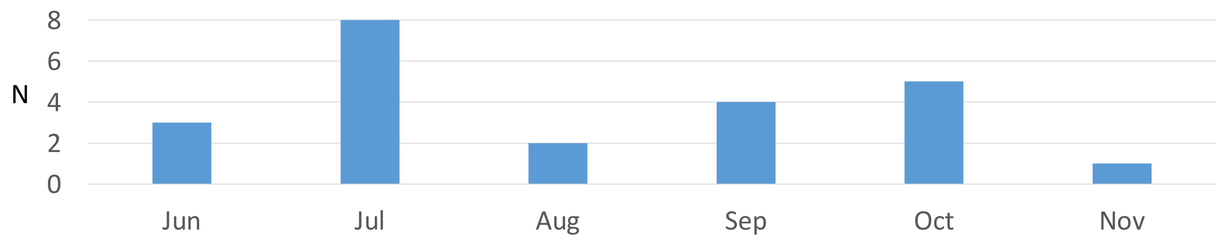
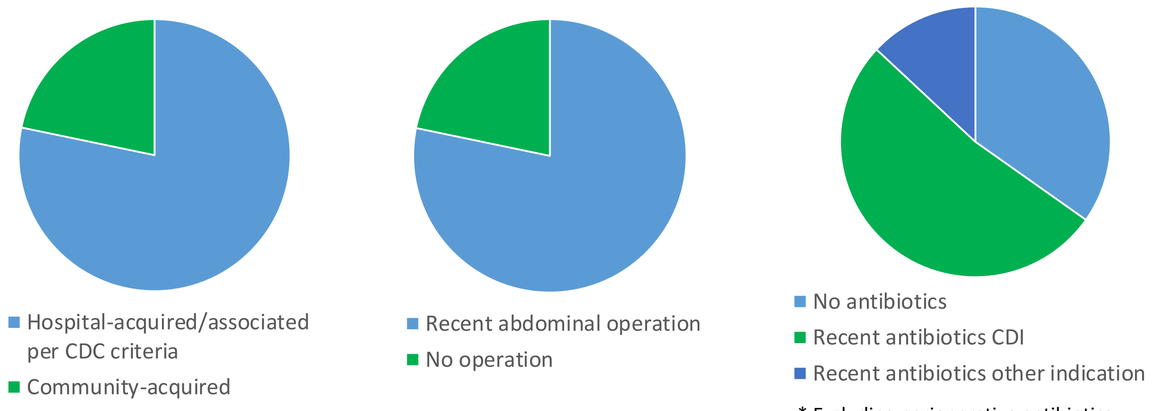


Figure 3. Clinicopathologic characteristics of CDI patient cohort (N=23).



CONCLUSIONS

- This cluster/pseudo-outbreak met the current infection control definition of a hospital outbreak based on temporal and spatial proximity
- WGS proved that vast majority were not in fact cluster-derived
  - Zero cases were definitely cluster-derived
- Results cast doubt on the ability of current infection control definitions to accurately identify linked cases
  - Support increased implementation of WGS
- Substantial proportion of CDI may be currently misclassified as hospital-associated
  - Unfair consequences for hospitals i.e. financial penalties
- Larger studies of similar ”outbreaks” warranted
  - Results may impel alterations in public health metrics (definitions, applications)

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