The CDC recommends that institutions in which carbapenemase-producing Enterobacteriaceae (CPE) is endemic perform active surveillance testing and maintain contact precautions for patients infected/colonized with CPE.1

The CDC does not provide guidance regarding discontinuation of contact precautions for patients infected/colonized with CPE.3

Through retrospective review of our institution’s CPE surveillance program, we sought to determine the utility of serial screening in predicting clearance of CPE colonization.

In April 2009, the University of Virginia Health System (UVAHS) initiated CPE surveillance:

- Weekly perirectal cultures for all patients in select ICUs, at the long-term acute care hospital, and on all units on which a CPE-positive patient was present
- Admission perirectal cultures for patients transferred from regions in which CPE is endemic or who were otherwise designated as high-risk for CPE colonization by the Hospital Epidemiologist
- All CPE-colonized/infected patients were maintained on contact precautions and a long-term indicator was entered in the electronic medical record.
- Follow-up perirectal cultures were collected on known CPE-colonized patients who were not receiving antibacterials, no sooner than 8 weeks after the initial positive culture, at an outpatient clinic visit or upon readmission to the hospital.

Study period: April 2009 - August 2013

All patients with a positive CPE perirectal culture obtained during the study period were included.

Patients with CPE from clinical isolates but without perirectal colonization were not included.

Recurrence of CPE-positivity was defined as a perirectal or clinical culture positive for carbapenemase production, following at least 1 negative perirectal culture.

Screening perirectal swabs:
- Placed in tryptic soy broth with a 10μg meropenem disk, incubated for 24h, plated on CHROMagar.
- Positives confirmed with blαKPC PCR testing.

Clinical isolates:
- Possible production of ESBL identified with automated testing (VITEK 2)
- Phenotypically screened with the indirect carbapenemase test.2
- Positives by phenotypic test underwent blαKPC PCR testing.

95 patients had ≥1 follow-up perirectal culture.

After 3 consecutive negative CPE perirectal cultures, 6 of 8 patients remained CPE-negative on all subsequent cultures (1-9 additional cultures).

One patient had CPE recurrence after 3 consecutive negative screens:
- Initially perirectally colonized with E. cloacae
- Recurred with blαKPC-positive Citrobacter sp. on perirectal culture nearly 8 months later

A second patient had CPE recurrence after 5 consecutive negative screens:
- Initially perirectally colonized with K. oxytoca
- Recurred with K. pneumoniae on perirectal culture 4 months later

The CDC supports discontinuation of contact precautions for patients colonized/infected with MRSA or VRE following 3 consecutive negative surveillance cultures obtained while the patient is not receiving antimicrobials.3

There is little data on the natural history of CPE colonization and the predictive utility of CPE surveillance cultures.

We found a 25% recurrence rate of CPE colonization after ≥3 consecutive negative perirectal cultures.

Extrapolation of data used to support discontinuation of contact precautions for MRSA- or VRE-colonized patients is not sufficient to determine when contact precautions can safely be discontinued for CPE-colonized patients.

Larger prospective studies are needed to define the natural history of CPE colonization and evaluate the utility of surveillance cultures in predicting clearance of colonization.

Select References

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