

Household Transmission of Carbapenemase-Producing Enterobacterales (CPE) in Ontario, Canada

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BACKGROUND

Data on household transmission of carbapenemase-producing Enterobacterales (CPE) remain limited. We studied the risk of CPE household co-colonization and transmission in Ontario, Canada.

METHODS

We enrolled CPE index cases (identified via population-based surveillance from January 2015 to October 2018) and their household contacts. At months 0, 3, 6, 9, and 12, participants provided rectal and groin swabs. Swabs were cultured for CPE until September 2017, when direct PCR (with culture of specimens if a carbapenemase gene was detected) replaced culture. Data regarding CPE risk factors were collected by interview and combined with isolate whole-genome sequencing to determine likelihood of household transmission. A multivariable logistic regression model with generalized estimating equations was used to explore risk factors for household contact colonization.

RESULTS

Ninety-five households with 177 household contacts participated. Sixteen (9%) household contacts in 16 (17%) households were CPE-colonized. Household transmission was confirmed in 3/177 (2%) cases, probable in 2/177 (1%), possible in 9/177 (5%), and unlikely in 2/177 (1%). Household contacts were more likely to be colonized if they were the index case's spouse (OR 6.17, 95% CI 1.05-36.35), if their index case remained CPE-colonized at the time of household enrollment (OR 7.00, 95% CI 1.92-25.49), or if they had at least one set of specimens processed after direct PCR was introduced (OR 6.46, 95% CI 1.52-27.40).

CONCLUSIONS

Nine percent of household contacts were CPE-colonized; 3% were a result of household transmission. Hospitals may consider admission screening for patients known to have CPE-colonized household contacts.

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