

Duration of colonization with KPC-producing bacteria at long-term acute care hospitals in Chicago, USA



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Background

Prevalence of *Klebsiella pneumoniae* carbapenemase-producing Enterobacteriaceae (KPC) in the USA is especially high in long-term acute care hospitals (LTACHs). High readmission rates can create a feedback loop, in which readmitted patients re-introduce the pathogen into the facility. Knowledge about the duration of colonization with KPC is essential to identify patients at risk of KPC carriage and to control the spread of KPC in LTACHs.

Methods

Data

- November 2011 until June 2013 in four LTACHs in the Chicago region, Illinois, USA
- Admission screening and every-other-week point prevalence cultures from all LTACH patients

Analyses

- Maximum likelihood analysis to assess the overall duration of colonization (ignoring discharges and readmissions), taking (false) negative cultures in between positive cultures into account and simultaneously calculate the sensitivity of the screening test for KPC
- Maximum likelihood analysis to assess the clearance rate in the time between discharge and readmission, taking interval-censoring into account (evaluating the first two readmission cultures)

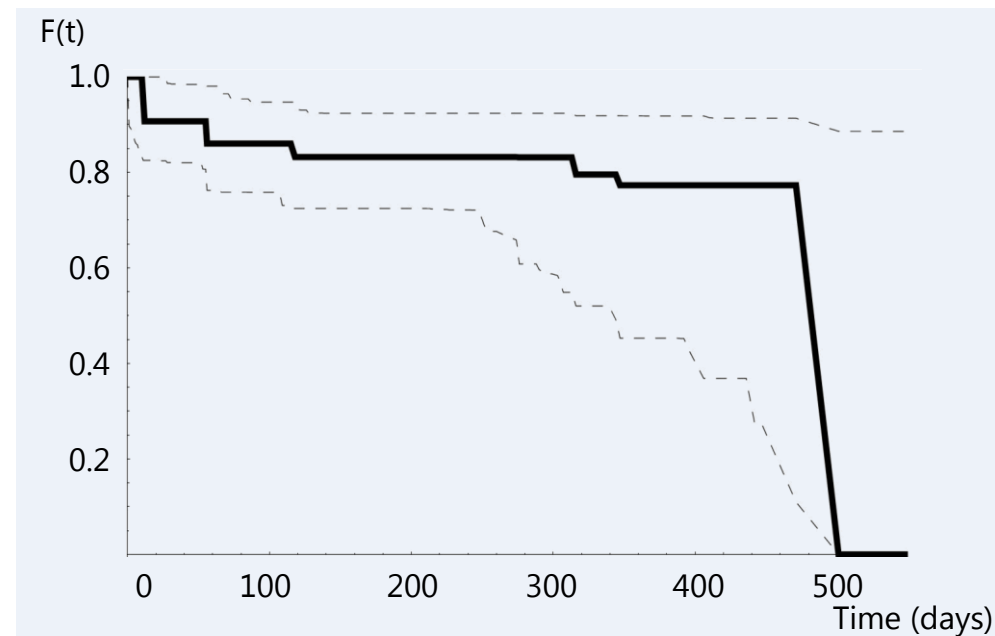


Figure 1: Overall duration of colonization

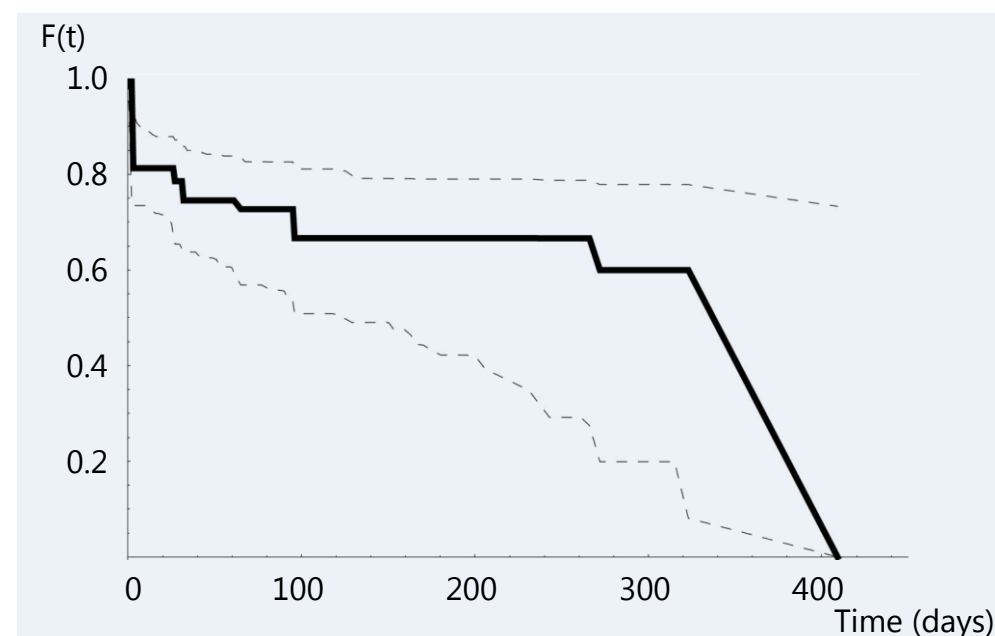


Figure 2: Clearance rate between discharge and readmission

Results

Overall duration of colonization (Figure 1)

- 1065 cultures from 625 patients
- Median duration of colonization with KPC was estimated to be 16 months (95% CI 11- ∞) when assuming that negative cultures in between positive cultures were false negative
- The estimated corresponding sensitivity of the screening test for KPC was 82%

Clearance rate between discharge and readmission (Figure 2)

- 242 (re-) admissions were available for 166 patients
- Median duration of colonization was 11 months (95% CI 4- ∞), assuming that patients are 'at risk' of clearance of KPC in the period between discharge and readmission
- (Re-)acquisition of a new strain is not taken into account, which could indicate an overestimation

Conclusion

About half of the LTACH patients colonized with KPC are still carriers after a year. Colonized patients seem to require isolation or other infection control precautions for a prolonged time.

