Quantifying the risk of nosocomial infection within Ebola Holding Units: a retrospective cohort study of negative patients discharged from five Ebola Holding Units in Western Area, Sierra Leone

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Introduction

Ebola Holding Units (EHUs) were a central pillar of the Ebola response in Sierra Leone. Suspected cases of Ebola were isolated, thereby preventing further potential community contact and/or potential contact inside general medical facilities. Patients were given treatment for acute febrile illness, and were tested for Ebola [1,2].

Positive cases were transferred to an Ebola Treatment Centres (ETCs). Negative cases were either discharged to the community or admitted to a general medical facility.

Negative patients and positive patients are in close proximity to each other, but little is known about the risk nosocomial transmission [3.4].

Study Aim: To estimate the risk of positive re-admission among patients discharged negative from EHUs in Sierra Leone (within 30 days) as an estimate of nosocomial transmission risk.

Photo showing Connaught EHU set-up © Mike Duff

Methods

Design: Retrospective cohort study of 543 patients who were discharged negative from EHUs between 13th Nov 2014 and 3rd Jan 2015.

Setting: Five government EHUs in Western Area of Sierra Leone, supported by King's Sierra Leone Partnership (KSLP). Each had between 6 and 23 beds.

Data collection: The cohort was (retrospectively) followed up for 30 days by monitoring all blood and mucosal swabs results from the six testing facilities in the Western Area. Lab results were matched to our cohort based on name and age using a matching algorithm in STATA, supplemented by a manual search. Where addresses were stated and differed, they were discarded. If the same, they were '*confirmed positive readmissions*'. Where indeterminate, they were '*possible positive readmissions*'.

Analysis: A positive re-admission ratio was calculated by dividing the number of positive readmissions by the total number of cases in the cohort. Positive re-admissions were also compared with the rest of the cohort in terms of demographic variables (age, gender) and exposure variables (duration of admission, Ebola positivity in the unit, bed occupancy).

Results

Positive readmissions: Out of a total of 543 negative discharges:

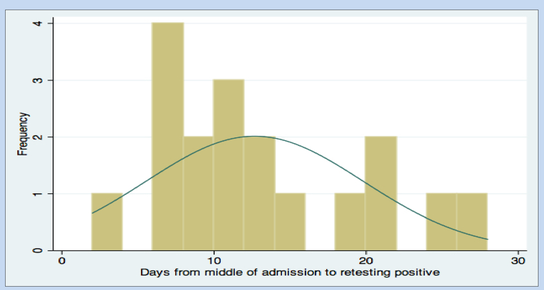
- 8 (1.5%) were *confirmed* positive readmissions
- 10 (1.8%) were *possible* positive re-admissions
- 525 (96.7%) had no positive follow-up tests
- Overall (*confirmed* and *possible*) positive readmission ratio was therefore 18/543 (3.3%)

Time from discharge to re-testing positive: 9 (5.25-16) days (compatible with an incubation period of 10-11 days).

There was no significant association between positive readmission and demographic variables or other potential risk factors.

Cohort Characteristics (n=543)	
Demographics	
-Age (median, IQR)	29 (22-44)
-Male (%)	328 (60%)
Median duration of holding unit admission (IQR)	2 (2-3)
Mean positivity of patients in the unit on day of discharge	38%

Table showing cohort characteristics, figure showing days to retest result



Conclusions

We found 1.5% confirmed positive readmissions and 1.8% possible readmissions within 30 days of discharge, therefore our highest estimate of nosocomial infection risk is 3.3%.

This is lower than the one other study in Sierra Leone, which found a 7% nosocomial infection rate [4]. Therefore the results are reassuring that infection prevention control measures between episodes of patient care protect the majority of individuals from acquiring Ebola within EHUs, making it a safe model of care.

Limitations: Nosocomial risk may be overestimated due to ongoing community transmission, and by over-matching due to common names. It may have been underestimated due to loss to follow-up, although surveillance was intense at this time so this is less likely.

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