Duodenoscopy involved in a carbapenemase-producing enterobacteriaceae outbreak in a gastroenterology intensive care unit: myth or reality?

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Introduction

Carbapenemase-producing Enterobacteriaceae (CPE) have become a major problem for healthcare settings. In October 2015, *K.pneumoniae* OXA-48 was isolated from samples from two patients hospitalized in the gastroenterology department of a university hospital (cases 1 and 2, Table 1). These patients underwent an endoscopic retrograde cholangiopancreatography (ERCP) with the same duodenoscope.

The hypothesis of contamination of these patients were :

1/ cross transmission in the gastroenterology department,

2/ cross transmission secondary to the use of a contaminated duodenoscope.

We report the epidemiological and microbiological investigations conducted to determine the origin of these contaminations.

Materials and Methods

Location

The University Hospital of Nantes has a capacity of 3069 beds and places. The gastroenterology department includes 26 beds (4 single rooms) in the conventional hospitalization ward and 8 beds (single rooms only) in the intensive care unit. In 2015, approximately 2 000 patients were hospitalized in these units.

Case definition

A case was defined as any patient hospitalized in the gastroenterology department or who received an endoscopic procedure with the duodenoscope between 10/20/2015 and 11/22/2015, and for which a strain of OXA-48 CPE was isolated from a clinical sample or screening.

Investigations

1/ Investigations conducted in the gastroenterology department: retrospective review and prospective surveillance of CPE contact patient for screening, contact isolation of CPE carriers,

2/ Investigations conducted on the duodenoscope: sequestration and microbiological sampling, review of reprocessing procedures, identification and screening of patients who underwent ERCP with this duodenoscope between December 2014 and November 2015,

3/ Molecular typing of CPE strains isolated,

4/ Alert to health authorities.

Results

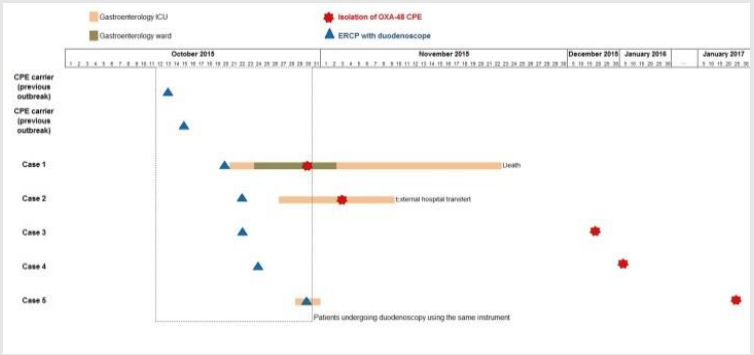

Figure 1. Description of CPE outbreak and its association to duodenosocopy

Case	Sex	Age	Date of CPE positive sample	Type of sample	Date of ERCP with the duodenoscope
1	M	68	10/30/2015	Clinical	10/20/2015
2	M	75	11/03/2015	Screening	10/22/2015
3	M	27	12/08/2015	Screening	10/22/2015
4	M	81	01/06/2016	Screening	10/23/2015
5	F	65	01/31/2017	Screening	10/30/2015

Table 1. Clinical characteristics of CPE carriers

During hospitalizations of CPE cases 1 and 2 in the gastroenterology department, 247 contact patients were identified. Among them, 59 were screened for CPE carriage, all were negative.

The duodenoscope used in October 2015 for both patients for an ERCP was sequestered in November 2015. The duodenoscope was sampled three times with different methods but OXA-48 CPE was never detected. Reprocessing records were reviewed: they were compliant with our institutional practices.

Between December 2014 and October 2015, 47 patients underwent ERCP with the same duodenoscope. 14 patients were rehospitalized after exposition and screened: 3 patients who underwent ERCP in October 2015 were positive (cases 3 -5, Table 1) for OXA-48 CPE detection. Cases 3 and 4 were not hospitalized during the same periods of hospitalization than cases 1, 2 and 5.

The CPE strains of cases 1 and 2 were compared by molecular typing and were found to be identical to CPE strains isolated from two carriers previously identified during a large outbreak in our hospital (1). Those five carriers received an ERCP with the same duodenoscope over a short period in October 2015.

Conclusions

Overall, 5 unknown cases of OXA-48 CPE were identified in patients from gastroenterology pathway. The duodenoscope was the only epidemiological link between these cases. We strongly suggest that this duodenoscope has become transiently contaminated following its use for known CPE carriers (Figure 1). Since the endoscope samples were negative, we cannot confirm this hypothesis. Similar cases have been reported in the literature, due to reprocessing difficulties of the immovable distal part (2-4). Special attention must be given to maintain efficient reprocessing of these endoscopes.

References

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