Successful Control of an Endoscopic Retrograde Cholangiopancreatography (ERCP)-Aassociated Nosocomial Outbreak Caused by *Klebsiella pneumoniae* carbapenemase (KPC)-producing *Klebsiella pneumoniae* in a University Hospital in Bogota, Colombia

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Background: *Klebsiella pneumoniae* carbapenemase–producing *K. pneumoniae* represents a major public health issue. Infection is a recognized complication of endoscopic retrograde cholangiopancreatography (ERCP). Infections caused by these organisms have been associated with high mortality rates, which might be due in part to the limited availability of antibiotic options. Therefore, prevention of acquisition of these organisms is essential.

Methods: We conducted an epidemiologic and molecular investigation to identify the source of the outbreak involving patients undergoing ERCP. We carried out reviews of the medical and endoscopic charts and microbiological data. An intervention program including practice audits, surveillance cultures of duodenoscopes and environmental sites, and molecular typing of clinical and environmental isolates was implemented.

Table 1. Clinical characteristics of patients

Age	Sex	Diagnosis	Incubation period	Type of sample	Microorganism	Procedure	Outcome
61	F	Pancreatitis,	0	Blood cultures - Pancreatic tissue -	*Klebsiella pneumoniae KPC*	CPRE + stent	Death
69	F	Pancreatitis	12 días	Abdominal collection	*Klebsiella pneumoniae KPC*	ERCP #3	Death
62	F	Colangitis	14 días	Abdominal collection	*Klebsiella pneumoniae KPC*	ERCP	Survival
33	F	Pancreatitis	10 días	Blood cultures	*Klebsiella pneumoniae KPC*	ERCP #3	Survival

Results: Between January and February 2015, 3 patients were identified with KPC-producing *K pneumoniae* related with ERCP, the first patient was the index case and presented the infection prior to the procedure; the other patients became infected after the procedure (Table 1). Clinical isolates were blaKPC gene carriers and were clonal (Figure 1). Routine surveillance cultures of endoscopes were repeatedly negative during the outbreak but the epidemic strain was finally isolated from one duodenoscope. The implementation of reprocessing equipment ERCP according to the recommendations of the CDC, staff education, elimination of reuse, and incorporating monitoring using bioluminescence and microbiological cultures allowed the control of the outbreak. For a year we have conducted weekly surveillance cultures of duodenoscopes and after each reprocessing surveillance with adenosine triphosphate (ATP) bioluminescence assays, if the result is greater than 100 relative light units (RLU)/s, the cleaning and disinfection procedure is repeated. There have not been new cases of infection since.

Figure1. Pulsed-field gel electrophoresis patterns of *Klebsiella pneumoniae* isolates from clinical samples

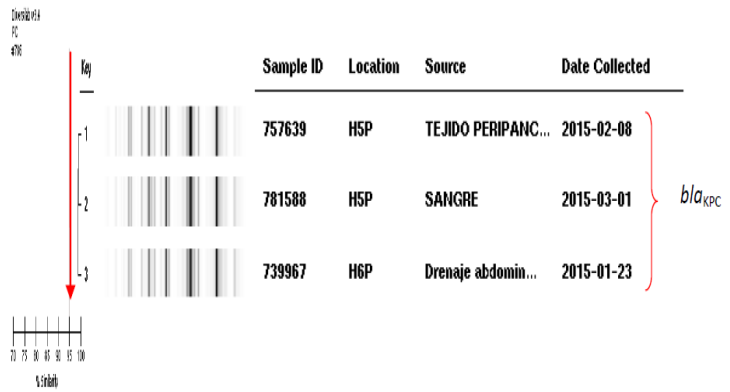
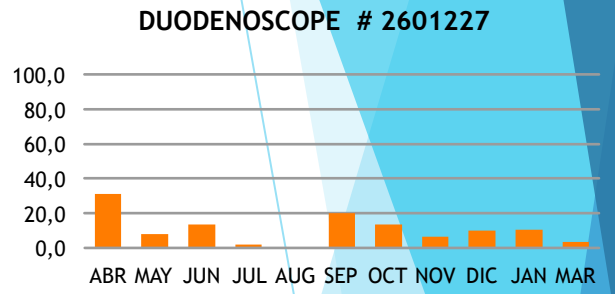
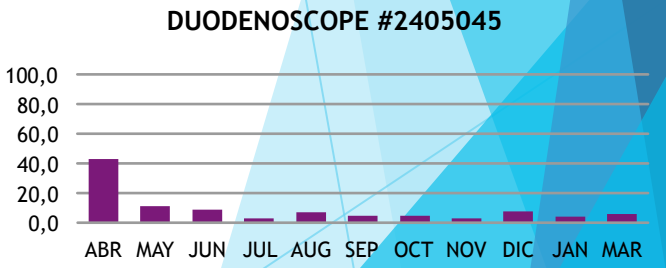


Figure 2 and 3. Follow up bioluminiscence >100 in duodenoscope. 2015 - 2016





Conclusion:
Control of an outbreak of KPC - *K. pneumoniae* related to ERCP can be successful through strict monitoring of cleaning and disinfection, education, and surveillance with cultures and bioluminescence.