Abstract:

Background:
We aim to determine the differential degree of contamination from air and room surfaces among patients (pts) colonized and infected with KPC-producing Gram-negative rods (KPC+). We also evaluated the impact of the anatomic source of KPC (e.g., rectum, respiratory) on the degree of contamination.

Methods:
This study was performed at a large hospital in Miami in all consecutive adult ICU pts detected to have KPC+ on clinical and active surveillance cultures (rectal cultures, and if intubated-tracheal cultures). Among KPC+ pts, air and environmental samples were obtained daily for 10 consecutive days or until discharged from hospital. Air was sampled using open blood agar plates (exchanged daily) placed above their headboards (2-ft from roof-tiles). Environmental surfaces sampled included bed rails, bedside tables, ventilator panels, and intravenous pumps. Sterile Q-tips were used to swap both, blood agar plates and environmental surfaces, immediately placed in 2ml TSB, incubated overnight, and then plated on MacConkey. Organisms were identified based on colony color, and morphology. Final identification was done by Vitek II. KPC+ was determined using Hodge test.

Results:
During 5-months, 17 KPC+ pts were identified: 8 rectal, 4 respiratory, and 5 from other sources (2 ascites, 2 wound and 1 urine). Air samples grew KPC+ in 4.3% of ambient air tested among pts colonized in the rectum, 4.3% for those colonized in the respiratory tract, and in 9.5% for those colonized in other sources. Regarding environmental samples, the percentages of positive samples were 4.8% for pts colonized in the rectum compared to 0.95% for those colonized in the respiratory tract (p=0.04) and 3% for those colonized in other sources.

Conclusion:
Environmental contamination with KPC+ seems to be higher among pts colonized in the rectum than among patients colonized in the respiratory tract or from other sources. In contrast, ambient air contamination seems to be similar between all 3 groups.

Background:
KPC-producing Gram-negative rods (KPC+) have emerged as an important nosocomial pathogen in the last years given their ability to hydrolyze most beta-lactam antibiotics including beta-lactamase inhibitors and even carbapenems1,2. On our previous observations with carbapenem-resistant Acinetobacter baumannii, we have shown the importance played by the site of colonization in the degree of air and environmental surfaces contamination with this organism3,4.

Aim:
In this study we aimed to evaluate the differential degree of air and environmental surfaces contamination in rooms occupied by patients that were either infected or colonized with KPC+. We also evaluated the impact of the anatomic source of KPC+ in the degree of contamination.

Results:

Methods:

Discussion:
We found no difference in air contamination in either of the groups. With regards to environmental surfaces, we found that patients colonized in the rectum contaminate more their immediate surrounding compare to those with either positive clinical cultures or colonized in the respiratory tract. Limitations of this project include being a single-center study with small sample size. The air sampling method we used is qualitative. Moreover, we did not collect clinical or demographic data from the patients (e.g. diarrhea, mechanical ventilation) that might have played a role on our results.