

SUPPLEMENTARY DATA - TABLE 2: Microorganism resistance to antibiotics and conclusions.

	Microorganisms analysis measure and metric	Impact on NF-GBN resistance to Group 2 carbapenems	Impact on Enterobacteriaceae resistance to group 2 carbapenems	Impact on Enterobacteriaceae resistance to cephalosporins/quinolones	Correlation between ertapenem consumption and GNB resistance to carbapenems	Comments	Conclusion
Cook et al. (2011) ⁹	graphic plots % of resistants	- <i>P. aeruginosa</i> 24% vs 16% (p value NP) - <i>A. baumannii</i> no difference (p value NP)	no difference (p value NP)	NP	- <i>P. aeruginosa</i> % of resistants correlation coefficient = -0.45815, p=0.003 - <i>A. baumannii</i> NP	There was a correlation of ciprofloxacin use with percentage and rate of carbapenems resistant <i>P. aeruginosa</i>	<i>P. aeruginosa</i> : decreased resistance to carbapenems <i>A. baumannii</i> : no difference <i>E. coli</i> : no difference <i>K. pneumoniae</i> : no difference
Eagye and Nicolau (2011) ⁸	first year vs last year % of susceptible	- <i>P. aeruginosa</i> 85.4% vs 81.0% (p=0.99) - <i>A. baumannii</i> NP	NP	NP	NP	<i>P. aeruginosa</i> susceptibility was not associated with ertapenem use neither other antibiotic classes across the study	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : NP <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP
Goff and Mangino (2008) ¹²	first year vs last year annual % of susceptible	- <i>P. aeruginosa</i> to IPM 71% vs 72% (p=0.92) - <i>A. baumannii</i> NP	- <i>E. coli</i> to IPM: 100% vs 100% (p value NP) - <i>K. pneumoniae</i> to IPM: 99% vs 99% (p value NP)	- <i>E. coli</i> ESBL: 1,07% vs 2,00% (p=0.30) - <i>K. pneumoniae</i> ESBL: 4% vs 18% (p<0.001)	NP	<i>K. pneumoniae</i> ESBL isolates increased was justified due to community or transplanted patients with multiple hospitalization on later period	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : NP <i>E. coli</i> : no difference <i>K. pneumoniae</i> : no difference
Goldstein et al. (2009) ¹¹	slope monthly % of susceptibles	- <i>P. aeruginosa</i> increased 1.74 (p<0.001) - <i>A. baumannii</i> NP	NP	- <i>E. coli</i> to LVX: 90% vs 83% (p value NP) - <i>K. pneumoniae</i> : NP	NP	The author associated improved susceptibilities to IPM decreasing consumption	<i>P. aeruginosa</i> : increased susceptibility to Group 2 carbapenems <i>A. baumannii</i> : NP <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP
Hsu et al. (2010) ¹⁵	slope 3 months resistants/1000 PD	- <i>P. aeruginosa</i> to IPM stable (p=0.37) - <i>A. baumannii</i> to IPM increased on blood isolates (p=0.03)	NP	- <i>E. coli</i> to CRO, CIP: increased 0.032 (p<0.05), increased 0.031 (p=0.02) respectively. - <i>K. pneumoniae</i> to CRO, CIP: decreased 0.074 (p<0.05), decreased 0.091 (p<0.05) respectively.	- <i>P. aeruginosa</i> no significant correlation.- <i>A. baumannii</i> positive correlation (R2=0.394) on IPM resistance	<i>A. baumannii</i> resistance to carbapenems was also correlated with LEV and TZP consumption. <i>E. coli</i> resistance was also correlated with quinolones, TZP and CRO consumption. <i>K. pneumoniae</i> resistance was not correlated with antibiotic consumption.	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : Increased resistance to Group 2 carbapenems on blood isolates <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP
Lee et al. (2013) ¹³	slope annual % of susceptible	- <i>P. aeruginosa</i> to MEM and IPM: decreased 0.798 (p=0.0184) and stable (p=0.1786) - <i>A. baumannii</i> to MEM and IPM: decreased 4.136 (p=0.007) and	- <i>E. coli</i> to MEM and IPM: stable (p=0.9209 and p=1.000) - <i>K. pneumoniae</i> to MEM and IPM: increased 1.058 (p<0.001) and stable (p=0.7877)	- <i>E. coli</i> to CAZ, CIP, LVX: increased 8.903 (p<0.001), stable (p=0.2822), increased 17.020 (p=0.0021) respectively. - <i>K. pneumoniae</i> to CAZ, CIP, LEV: increased 11.619 (p<0.0027), stable (p=0.6844), increased 20.722 (p=0.0023).	- <i>P. aeruginosa</i> to MEM and IMI: correlation coefficient = -0.148, p=0.0330 and correlation coefficient = -0.355, p=0.1731 - <i>A. baumannii</i> to MEM and IMI: correlation coefficient = -0.796, p<0.001 and correlation coefficient = -1.077, p<0.001	There was a significant negative correlation of ertapenem use and MEM susceptibility on GNB, but the same with MEM use and MEM susceptibility. There was a significant increase in <i>E. coli</i> susceptibility to CAZ, but in other hand, total <i>E. coli</i>	<i>P. aeruginosa</i> : decreased susceptibility to Group 2 carbapenems <i>A. baumannii</i> : decreased susceptibility to Group 2 carbapenems <i>E. coli</i> : no difference <i>K. pneumoniae</i> : increased susceptibility to Group 2 carbapenems

		decreased 5.195 (p<0.001)				ESBL-producing increased.		
Lim et al. (2013) ¹⁴	first month vs last month resistants/1000 PD	- <i>P. aeruginosa</i> 0.25 vs 0.35 (p value NP) - <i>A. baumannii</i> NP	NP		- <i>E. coli</i> to CRO, CIP: 1.6 vs 2.0 (p value NP), 3.2 vs 3.7 (p value NP) respectively. - <i>K. pneumoniae</i> to CRO, CIP: 2.4 vs 1.5 (p value NP), 2.2 vs 1.1 (p value NP) respectively.	- <i>P. aeruginosa</i> correlation coefficient = 0.5648, R2=0.3190, p=0.089 - <i>A. baumannii</i> correlation coefficient = -0.6485, R2=0.0911, p=0.397	Conclusions were based on correlation of ertapenem use and incidence rate of resistant pathogens. There was correlation between ertapenem increasing use and cefepime decreasing. MEM also increased its usage but was not statistically measured.	<i>P. aeruginosa</i> : increased resistance to Group 2 carbapenems <i>A. baumannii</i> : no difference <i>E. coli</i> : Group 2 carbapenems NP <i>K. pneumoniae</i> : Group 2 carbapenems NP
Lima et al. (2009) ¹⁰	pre period vs post period % of resistants	- <i>P. aeruginosa</i> 20.0% vs 0.0% (p>0.05) - <i>A. baumannii</i> NP	NP	NP	NP		Although a noticed difference in resistance proportions, these numbers are about 20 vs 18 strains, and no difference was noticed in the trend over time	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : NP <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP
Pires dos Santos et al.(2011) ⁷	pre period vs ertapenem period resistants/1000 PD	- <i>P. aeruginosa</i> 0.51 vs 0.43 (p=0.33) - <i>A. baumannii</i> NP	NP	NP	NP		Introduction of ertapenem was associated with a decrease in IPM and MEM use. By multivariate analysis, only alcohol hand-gel was correlated with the decrease in CR- PA in the last period	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : NP <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP
Rodriguez- Osorio et al. (2015) ⁶	slope 4 months resistants/1000 isolates	- <i>P. aeruginosa</i> increased 6.26 (p<0.05) - <i>A. baumannii</i> increased 25.39 (p<0.001)	- <i>E. coli</i> increased 0.46 (p<0.05) - <i>K. pneumoniae</i> increased 8.06 (p<0.001)		- <i>E. coli</i> to CAZ, CRO, CIP: increased 6.92 (p<0.001), increased 10.00 (p<0.001), decreased 1.45 (p>0.05) respectively. - <i>K. pneumoniae</i> to CAZ, CRO, CIP: increased 11.72 (p<0.001), 17.52 (p<0.001), 2.29 (p>0.05) respectively.	NP	In a multiple linear regression analysis adjusted for length of stay, hospital acquired infections and other 10 antibiotic usage ertapenem was not associated with changes in resistances	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : no difference <i>E. coli</i> : no difference <i>K. pneumoniae</i> : no difference
Sousa et al. (2013) ¹⁷	slope monthly resistants/1000 isolates on ertapenem period	- <i>P. aeruginosa</i> to IPM decreased 0.005 (p<0.001) - <i>A. baumannii</i> to IPM stable (p=0.54)	NP	NP		Correlation was not calculated between ertapenem use and incidence of IPM resistant strains. However, decreased IPM consumption was correlated to decreased IPM resistance	In a multiple regression analysis CIP, GEN, IPM, outbreaks and other variables were associated with the incidence density of IPM resistance strains.	<i>P. aeruginosa</i> : decreased resistance to Group 2 carbapenems <i>A. baumannii</i> : no difference <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP
Yoon et al. (2014) ¹⁶	first period vs last period monthly % resistants	- <i>P. aeruginosa</i> 18.1% vs 19.4% (p=0.648) - <i>A. baumannii</i> 52.2% vs 69.9% (p<0.001)	NP		- <i>E. coli</i> ESBL 31.8% vs 43.4% (p<0.001) - <i>K. pneumoniae</i> ESBL: 20.1% vs 41.7% (p<0.001)	There was a correlation between Group 2 carbapenem consumption during a previous month and carbapenem resistant <i>A. baumannii</i> proportion on following month (p=0.03)	Despite an increased proportion of carbapenem resistant <i>A. baumannii</i> , there was no correlation with ertapenem consumption on previous month and increased proportion on following month (p=0.941)	<i>P. aeruginosa</i> : no difference <i>A. baumannii</i> : no difference <i>E. coli</i> : NP <i>K. pneumoniae</i> : NP

CAZ: ceftazidime, CIP: ciprofloxacin, CPM: cefepime, CRO: ceftriaxone, GEN: gentamicin, IPM: imipenem, LVX: levofloxacin, MEM: meropenem, MXF: moxifloxacin, TZP: piperacillin/tazobactam, CR-PA: carbapenem-resistant *P. aeruginosa*, NP: Not provided, OBD: occupied beds-day, PD: patient-day.