

**EV0365**

**ePoster Viewing**

**Resistance surveillance & epidemiology: Gram-negatives**

**The effect of probiotics on *in vitro* growth of Carbapenemase producing *Klebsiella pneumoniae* (KPC-Kp)**

Silvia Corcione\*<sup>1</sup>, Laura MC Dermott<sup>2</sup>, Cheleste Thorpe<sup>2</sup>, Francesco Giuseppe de Rosa<sup>1</sup>, David R. Snydman<sup>3</sup>

<sup>1</sup>University of Turin, Infectious Diseases, Medical Sciences, Turin, Italy

<sup>2</sup>Tufts Medical Center, Boston, United States

<sup>3</sup>Tufts Medical Center, Boston, MA, United States

**Background:** Carbapenemase producing *Klebsiella pneumoniae* (KPC-Kp) is a public health concern and increasing importance worldwide. Having a healthy microbiota could prevent the expansion and persistence of exogenously acquired bacterial species, but this mechanism can be impaired by antibiotic treatment. Research suggests that when probiotics, such as *Lactobacillus rhamnosus* GG (LGG) and *E.coli* Nissle (EcN), are regularly ingested as part of the diet, may boost the body's immune system and maintain intestinal balance through providing healthy microflora. So far no data are available regarding the role of probiotics on KPC-Kp growth. In a series of *in vitro* studies we evaluate the impact of LGG and EcN on the growth of KPC-Kp.

**Material/methods:** We conducted a series of *in vitro* studies on the effect of LGG and EcN on KPC-Kp using and co-culture and conditioned fresh media. KPC-Kp (ATCC BAA 1705), EcN, LGG (ATCC 53103) and *E. coli* ATCC 25922 (control strain) were used in this study. Single culture of each strain was performed as a growth control. Incubation was under anaerobic conditions. MacConkey plates were incubated overnight at 35°C in ambient air, MRS under anaerobic conditions for 48 hours. Regarding conditioned Media, overnight starter cultures were prepared for the ECN, LGG, and *E.coli* control strains. pH was adjusted to 7, and the medium was then filtered. Growth was evaluated at time = 0, 4, 24 and 48 hours. To evaluate the effect of pH on the growth of the KPC-Kp LB: MRS broth were prepared at varying pH values: 4.5, 5.0, 5.5. The results were confirmed with at least three independent experiments. Each sample was assayed in triplicate and the mean activity and standard deviation are presented. Student's t test was performed.

**Results:** KPC-Kp growth was evaluated using co-culture and fresh media for LGG and EcN respectively. We observed a decrease in KPC-Kp growth with EcN using fresh conditioned media at 4h and 48h after co-incubation (7.6 Log CFU/ml Vs. 7.2; p= 0.011 and 8.2 Vs. 7.7 log CFU/ml; p= 0.02, respectively). The same decrease was observed when KPC-Kp was co-cultured with LGG, with a significant decrease in growth at 48 h (7.8 Vs.6.2 Log CFU/ml p= 0.03). Our data showed that a pH <4.5 was associated with a higher growth reduction, especially at 48 h ( 4.7 Vs. 7.8 Vs. 8.2 log CFU/ml; p= 0.02). We further measured the median pH of LGG and EcN co-culture which was 5.1 and 6.4 for LGG and EcN co-culture respectively.

**Conclusions:** Probiotics seems to affect KPC-Kp growth *in vitro* and they may serve to establish a non antibiotic regimen as a possible intervention for multidrug resistant organisms. Lactic acid at sufficiently acidic pH is a potent microbicide, that may partially influence KPC-Kp growth.