JOURNAL ARTICLE

Pantoprazole promotes sustained intestinal carriage of multidrug-resistant *Escherichia coli* in amoxicillin-treated mice

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Abstract

Aims

The main objective of this study was to compare extended-spectrum β-lactamase (ESBL) *Escherichia coli* fecal titers during 12 days between two groups: mice who received proton pump inhibitors (PPIs) and those that did not.

Methods and results

We tested three different in vivo models: model 1, high inoculum (10^6 CFU ml^{-1}); model 2, low inoculum (10^2 CFU ml^{-1}); and model 3, low inoculum and 2-day amoxicillin wash-out. There was no significant difference between the two groups in fecal ESBL *E. coli* titers in models 1 and 2. The fecal titers of ESBL *E. coli* were probably too high to show differences in colonization related to PPI treatment. By introducing a 2-day wash-out period after stopping amoxicillin (model 3), the fecal ESBL *E. coli* titers were higher in the PPI-treated mice during 12 days (3 log versus 11 log day CFU g^{-1}; $P < 0.05$). This result highlighted that PPIs promote stable ESBL *E. coli* digestive carriage in mice. Fecal quantitative PCR showed that mice with low ESBL *E. coli* fecal titers had a much higher concentration of equol-producing bacteria, *Muribaculum* sp., and *Adlercreutzia caecimuris*.

Conclusions

Pantoprazole treatment promotes sustained digestive carriage of ESBL *E. coli* in amoxicillin-treated mice.

Keywords: extended-spectrum β-lactamase, *Escherichia coli*, digestive carriage, proton pump inhibitors, amoxicillin-treated, mice

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