DECREASE OF LEVOFLOXACIN FECAL CONCENTRATIONS IN EXPERIMENTAL DOGS USING DAV132, AN ORAL ADSORBENT DELIVERED TO THE ILEUM/Colon

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Abstract

Background. Accumulation of antibiotic residues in the colon is thought to be key in the dynamics of bacterial resistance. Levels of fecal levofloxacin correlated with AUCs of levofloxacin/85. Hence, daily oral treatment with DAV132 reduced fecal concentrations of levofloxacin very efficiently, and in a dose-dependent manner. The effect of this reduction on intestinal microbial resistance is presently under study.

Methods

Materials. DAV132 is an enteric-coated formulation containing a charcoal-based absorbent formulated to deliver the charcoal-based absorbent in the ileum and colon. DAV132 was incorporated into the diet at the dose of 0.6 g/kg.

Animals. Study included 24 male Beagle dogs (8-12.5 kg) receiving levofloxacin and placebo solution. Dogs were housed in an individual cages for 7 days before the start of the study. All feces were collected during the following periods: day 0 (pre-treatment), day 1, day 3, day 5, day 8, day 10, and day 24.

Results. No levofloxacin was detected in any samples from the group “Double Placebo”, nor for DAV132. Fecal levofloxacin concentrations were statistically lower in dogs treated with DAV132 than in dogs treated with placebo solution only. A decrease in fecal levofloxacin concentrations was observed in all groups treated with DAV132. The concentration of levofloxacin in feces between DAV132 and placebo was 72% and 85% for the doses of 0.6 and 0.3 g/kg of body weight, respectively. (Figure 1). The concentration of levofloxacin in feces was significantly different between the groups treated with DAV132 and the group treated with placebo solution (p<0.05).

Discussion

In conclusion, in this Beagle dog model, the human situation was modelled in terms of therapeutic doses of levofloxacin and of levofloxacin concentrations reached in faeces of healthy individuals.

Consequently, the administration of DAV132 at the dose of 0.3 g/kg of body weight per day decreased the fecal concentration of levofloxacin by 72%. The administration of DAV132 at the dose of 0.6 g/kg of body weight per day decreased the fecal concentration of levofloxacin by 85%. Hence, daily oral treatment with DAV132 reduced fecal concentrations of levofloxacin very efficiently, and in a dose-dependent manner. The effect of this reduction on intestinal microbial resistance is presently under study.

References


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Figure 1: Fecal concentrations of levofloxacin

Figure 2: Plasma concentrations of levofloxacin in dogs DAV132 Placebo.png

Figure 3: Fecal concentrations of levofloxacin in dogs DAV132 Placebo.png

Figure 4: Fecal concentrations of levofloxacin in dogs DAV132 Placebo.png