Effect of fasting on the plasma pharmacokinetic of co-administered albendazole-praziquantel in dogs

Valentina Chiappetta, Emilia Pose, Pablo Nejamkin, Candela Canton, Laureano Schofs, Lucila Moriones, Paula Dominguez, Carlos Lanusse, Laura Ceballos, Luis Alvarez. *Laboratorio de Farmacología, Centro de Investigación Veterinaria de Tandil (CIVETAN), UNCPBA-CICPBA-CONICET, Facultad de Ciencias Veterinarias, Tandil, Buenos Aires, Argentina.*

Helminth control in dogs is important not only from the perspective of the animal's health but also to prevent the occurrence of parasitic zoonosis such as echinococcosis, ascariasis and ancylostomiasis in humans. Their favorable safety and efficacy profile makes albendazole (ABZ) - praziquantel (PZQ) co-administration one of the most widely used strategy for helminth control in dogs. As Class II drugs of the Biopharmaceutical Classification System, they have low aqueous solubility and high permeability. Additionally, both compounds increase their water solubility at low pH values. In canines, ABZ-PZQ are typically administered as tablet, and gastric retention time may result crucial for its dissolution. Dissolved drug is the only form that can reach the target parasite and exerts its action. The objective of this study was to evaluate the effect of fasting on the plasma pharmacokinetics of ABZ and PZQ in dogs. Pharmacokinetic Studies: In a crossover design, six healthy dogs were divided into two groups (n=3): Fasting (8-hour) and Fed (fed with high-quality commercial balanced food). Both groups received oral ABZ-PZQ (10 mg/kg and 5 mg/kg, respectively). Serial blood samples were collected in heparinized tubes before treatment (time 0) and at various intervals up to 48 h post-treatment. The plasma was stored at -18°C until analysis by HPLC. After a 10-day washout period, the groups were switched, and the procedure was repeated. The pharmacokinetic analysis was performed using the PK Solutions software. Results: ABZ was not detected in plasma of the Fasting group, and only trace amounts were quantified in the Fed group. The systemic availability of the active ABZ-sulphoxide (ABZSO) metabolite was higher after food ingestion (Fed group: 7.7 ± 2.6 µg.h/mL) compared to the Fasted group (1.7 ± 0.5 µg.h/mL). Similar results were observed for PZQ. Conclusion: The presence of food improves ABZ-PZQ dissolution and potentially increase the amount of drug that reaches the parasite enhancing its efficacy. To ensure maximum effectiveness, ABZ and PZQ should always be administered with food to dogs.

Key words: Albendazole; Praziquantel; Pharmacokinetics; Dogs.