Therapeutic Effects of Albendazole on Disposition Kinetics of Florfenicol in Goats

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Abstract

Effect of albendazole on the pharmacokinetics of florfenicol was investigated in ten healthy adult goats. In each experiment, after restraining the animal, a single dose of florfenicol was administered intramuscularly. After wash out period of 7 days, florfenicol along with albendazole suspension was administered orally. Blood samples were collected in plastic centrifuge tubes. Prior to drug administration, a control blood sample was collected in each experiment. Following drug administration, blood samples were drawn at half hourly interval up to 4 hours followed by hourly interval up to 8 hours and thereafter, at 10 and 12 hours. Blood samples were centrifuged and serum was separated and stored at -20°C until analysis. The concentration of florfenicol in serum samples was determined by using high performance liquid chromatography (HPLC) technique. The results of present study indicated that albendazole significantly (P<0.05) increased or decreased the pharmacokinetic parameters of florfenicol after their concurrent administration i.e. decreased peak serum concentration (4.22 ± 0.32 to 3.3 ± 0.21 µg mL\(^{-1}\)), extrapolated zero time drug concentration B (5.29 ± 0.46 to 4.85 ±0.51 µg mL\(^{-1}\)), elimination half-life t\(_{1/2 \beta}\) (6.56 ± 0.94 to 5.06 ± 0.77 hours) and increased volume of distribution \(V_d\) (4.05 ± 0.35 to 4.49 ± 0.4 L kg\(^{-1}\)) and total body clearance \(CL_B\) (0.47 ± 0.04 to 0.69 ± 0.06 mL min\(^{-1}\) kg\(^{-1}\)). As florfenicol is metabolized by the same cytochrome P450 isoenzymes (CYP1A1 and CYP1A2) which are induced by albendazole, the change in pharmacokinetics parameters of florfenicol may be attributed to its drug action with albendazole. Thus it may be conceived that the change in pharmacokinetic parameters is due to rapid elimination of florfenicol when given concurrently with albendazole to healthy adult goats which in turn may be due to induction of CYP3A4 isoenzyme by albendazole.

Keywords: Florfenicol, Albendazole, Cytochrome, Disposition kinetics, Clearance and volume of distribution