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Disposition Kinetics of Ciprofloxacin after Intramuscular Administration in Lohi Sheep

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Abstract : This study was conducted to investigate the disposition kinetics of ciprofloxacin and calculate its optimal dosage in Pakistani sheep of Lohi breed. Injectable preparation of ciprofloxacin was given intramuscularly to eight sheep at a dose of 5 mg/Kg. Before administration of drug blood sample was drawn from each animal. Post drug administration, blood samples were also drawn at various predetermined time periods. Drug concentration in the blood samples was assessed through high performance liquid chromatograph (HPLC). Data were best described by two compartment open model and different pharmacokinetic (PK) parameters were calculated. Cmax of 1.97 ± 0.15 µg/ml was reached at Tmax of 0.88 ± 0.09 hours. Half life of absorption (t1/2 abs) was observed to be 0.63 ± 0.16 hours while t1/2 α (distribution half life) and t1/2 ß (elimination half life) were found to be 0.46 ± 0.05 and 2.93 ± 0.45 hours, respectively. Vd (apparent volume of distribution) was calculated as 2.89 ± 0.30 L/kg while AUC (area under the curve) was 7.19 ± 0.38 µg.hr/mL and CL (total body clearance) was 0.75 ± 0.04 L/hr/kg. Using these parameters, an optimal intramuscular dosage of ciprofloxacin in adult Lohi sheep was calculated as 21.43 mg/kg, advised to be repeated after 24 hours. From this, we came to the conclusion that calculated dose was much higher than the dose advised by the foreign manufacturer and to avoid antimicrobial resistance, it is advised that this locally investigated dosage regimen should be strictly followed in local sheep.

Keywords : pharmacokinetics, dosage regimen, ciprofloxacin, HPLC, sheep
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