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Disposition of ceftriaxone following single intravenous, intramuscular and intramammary administration with special reference to its metabolism in small ruminant model

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Abstract

Disposition of Ceftriaxone in ruminants is different from human beings. So, disposition of Ceftriaxone was studied in Black Bengal goats following different routes of parenteral administration @ 50 mg / kg. Plasma and milk concentration of Ceftriaxone and its metabolite was analyzed by HPLC. The kinetic behavior of Ceftriaxone followed 'one compartment open model' healthy non-lactating / lactating goats following intravenous administration. The mean value of $t_{1/2}$ β was 0.19± 0.002 hr and 0.21± 0.01 hr in non-lactating and lactating goats, respectively. The mean Vd_{area} value (0.47± 0.08 lit/ kg and 0.28± 0.01 lit/ kg) did not alter significantly ($p<0.05$) between two groups. The pharmacokinetic profile of Ceftriaxone showed major hepatic clearance compared to renal clearance in both the groups. Ceftriaxone could not be detected in urine but its active metabolite i.e. ceftizoxime was first time identified by determining its concentration till 72 hour post dosing. Ceftizoxime concentration in milk was also increased with advancement of time which peaked at 48 hour and persisted for a longer period following single intravenous dosing. Disposition of Ceftriaxone showed absorption and re-absorption phase following single intramuscular dosing and mainly ceftizoxime was excreted through urine while it was detected up to 24 hour post dosing in milk. Neither Ceftriaxone nor ceftizoxime could be detected in plasma and urine of lactating goats following intramammary administration, but only Ceftriaxone was available up to 36 hours pd in milk. Ceftriaxone induced cytochrome P450 in liver of the animals following single dose intravenous administration @ 50 mg / kg.

Biography

Tapas Kumar Sar completed his PhD in 2004 from Department of Veterinary Pharmacology and Toxicology, West Bengal University of Animal & Fishery Sciences, Kolkata, India. At present he is working as Head of the Department. He has published 24 research papers in reputed International and National Journals. He has presented his research findings in different International and National Conferences. He has contributed some chapters in Veterinary Pharmacology book and written popular articles in different technical bulletins.