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Primaquine-chitosan nanoparticles enhance drug delivery to liver tissue in mice

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Chitosan-based nanoparticles have gained attention as drug delivery carriers because of their stability, low toxicity and simple and mild preparation method. Moreover, they provide versatile routes of administration. The aim of this study was to prepare primaquine-loaded chitosan nanoparticles to enhance drug transport to the liver. Primaquine-loaded chitosan nanoparticles were prepared by using ionic gelation. Nanoparticles were characterized by particle size distribution, entrapment efficiency, zeta potential and morphology: the results of two preparation methods out of 20 variations tested are presented. The characterization of preparation method XVII exhibited a peak of particle size distribution at 248.8 nm, peak width of 29.61 nm,while method XX had its peak of particle size distribution at 47.9±13.7 nm, polydispersity index of 0.313 and a zeta potential of +18.5 mV. From all preparation methods, XVII exerted best entrapment efficiency of 54.7% and was therefore chosen pharmacokinetic comparison. Conventional primaquine and primaquine-loaded chitosan nanoparticles were administered orally to rats in order to compare the pharmacokinetic profiles.In rats,we observed 2-2.5 times smaller primaquine plasma concentrations with nanoparticles than with conventional primaquine, but 3 times higher concentration in the liver. This study exhibited that primaquine-loaded chitosan nanoparticles successfully enhanced drug transport toliver.

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Effect of herbal bioenhancer "Trikatu" on pharmacokinetics of cefepime following intramuscular administration in cross-bred calves

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To study the effect of herbal bio-enhancer "Trikatu" on pharmacokinetics of cefepime following intramuscular administration in healthy cross-bred calves, cefepime was administered by single intramuscular dose of 10 mg.kg`-1 body weight either alone or along with co-administration of Trikatu at the dose of 2 gm. kg`-1 b.wt. orally. Following single i.m. administration of cefepime along with co-administration of Trikatu, the peak plasma concentration of cefepime was significantly higher (20.4±0.45 µg.ml-1) than the peak plasma concentration obtained after the administration of cefepime alone (18.5±0.31 µg.ml-1) at 45 min. The mean value of area under the first moment of plasma drug concentration-time curve (AUMC) was significantly increased (307.8±11.8 µg.ml-1.h2) when Trikatu was co-administered with cefepime as compared to AUMC (252.5±3.24 µg.ml-1.h2) when cefepime was administered alone. There was significant reduction in the mean values of B, β and Cl_B for cefepime following co-administration with Trikatu (18.7±0.59 µg.ml-1, 0.247±0.01 h-1 and 0.151±0.01 L.kg-1.h-1 respectively) as compared to the value (22.3±0.49 µg.ml-1, 0.296± 0.001 h-1 and 0.179±0.001 L.kg-1.h-1 respectively) obtained after administration of cefepime alone. The mean value of t1/2β (2.83±0.10 h) was significantly higher when Trikatu co-administered with cefepime in cross-bred calves as compared to the t1/2β (2.34±0.01 h) obtained after administration of cefepime alone. The co-administration of Trikatu with cefepime significantly reduced the i.m. loading and maintenance dosage (11.2 mg.kg-1 followed by 10.6 mg.kg-1 b. wt. at 12 h intervals) when Trikatu is co-administered with cefepime in healthy cross-bred calves as compared to i.m. administration of cefepime alone (17.2 mg.kg-1 followed by 16.7 mg.kg-1 b. wt. at 12 h intervals).

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