MODULATION OF PHARMACOKINETICS OF PEFLOXACIN AND CEFUROXIME BY HERBAL BIOENHANCERS IN MOUNTAIN GADDI GOATS

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One of the major limitations of antibacterial therapy in SMALL RUMINANTS is their limited bioavailability and erratic absorption following oral administration. Therefore, in the present paper the effect of the pretreatment of herbal bio-enhancer, trikatu (equal parts of Piper longum, Piper nigrum and Zingiber officinale) on the pharmacokinetics of orally administered pefloxacin and cefuroxime in mountain Gaddi goats (n=6) is presented. The herbal bio-enhancer, trikatu (Piperine contents 2.02%, w/w) was administered at the dose rate of 2g/kg orally in the goats for 14 days prior to pharmacokinetic trials. The antibacterial agents, pefloxacin and cefuroxime were administered to goats at the dose rate of 20 mg/kg. The plasma was separated for the assay of microbiologically active pefloxacin and cefuroxime using agar plate diffusion method using E.coli (ATCC 25922) and Staphylococcus aureus (ATCC 6538) for pefloxacin and cefuroxime, respectively. The plasma concentration time curve was used to determine pharmacokinetics.

The plasma concentrations were significantly higher at 4, 6, 8 and 12 h (during the elimination phase). The findings of the investigation also revealed higher values of area under curve, the area under the first moment of plasma drug concentration time curve, the mean residential time, the total duration of the antimicrobial action and the bioavailability. Trikatu treatment, however, significantly reduced the elimination half life and zero time intercept of the elimination phase. The apparent volume of the distribution based total area under plasma drug concentration curve and apparent volume of distribution based on zero time plasma concentration intercept of elimination phase were significantly higher in trikatu treated animals indicating a better penetration of drug. Based on MIC of 0.8 µg/ml of pefloxacin, a priming dose 6.0 mg/kg and the maintenance dose of 2.21 mg/kg is required to administered at 8 h intervals following trikatu treatment. For practical purposes, this would mean a priming dose of 6mg/kg and the maintenance dose of 2mg/kg given by oral route, to be repeated at 8 h intervals.

The plasma levels of cefuroxime could not be detected at any of the time interval following its oral administration. The pretreatment of trikatu also did not influence the kinetic behavior of the antibiotic.