TOXIC EFFECT OF CIPROFLOXACIN MAY BE THE RESULT OF A FREE RADICAL PATHWAY

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Fluoroquinolones (FQs), such as ciprofloxacin (CPFX), represent an important class of antimicrobial agents used in the treatment of a wide range of infectious diseases. However, these drugs are also associated with a low incidence of adverse effects related to gastrointestinal and central nervous system (CNS) function.

In previous studies, we showed that CPFX induced oxidative stress in cerebral and hepatic tissues of rats *in vivo*, and on cultured human fibroblast cells *in vitro.* The protective effect of vitamin E on these systems was also shown.

In this study, the aim was first, to investigate the possible cytotoxic effects of CPFX on primary culture of astrocytes, and then to determine the mechanism of its action on hepatic microsomal system; free radical pathway was evidenced by Electron Spin Resonance (ESR) spectroscopy using spin-trapping technique.

The cultured cells were incubated with CPFX at various concentrations and cytotoxicity was determined by neutral red and MTT methods. A decrease in cell viability was showed with the higher concentrations of drug after 48, 72 and 96 hours of incubation. In the microsomal system, CPFX induced free radical production in a dose and time-dependent manner. Free radical production was completely inhibited by iron chelators such as desferroxamine and DTPA. Furthermore, treatment of microsomes with vitamin E provided significant protection.

Actually, similar experiments are carried out using ESR spectroscopy in order to demonstrate the same radical formation in cerebral microsomes. In addition, mass spectroscopy experiments will allow us to identify the trapped radical.