The Effects of Glycyrrhetinic Acid on the Pharmacokinetics of Cortisol in Rats

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SUMMARY. The aim of our study is to investigate the pharmacokinetics of cortisol in rats after administration of glycyrrhetinic acid (GA) and cortisol. Healthy male Sprague-Dawley rats were randomized to be given 20 mg/kg cortisol (F group) or cortisol combined with 10 mg/kg glycyrrhetinic acid (F+GA group). The serum concentrations of cortisol were determined by HPLC and pharmacokinetic parameters were analyzed by double-compartmental method. The urine concentrations of cortisol and cortisone were determined by HPLC and the ratio of cortisone/cortisol was measured to evaluate the activity of 11β-hydroxysteroid dehydrogenase 2 (11β-HSD2). The pharmacokinetic parameters of cortisol in the two groups were: (60.081 ± 10.705) and (61.086 ± 4.313) min for t1/2β; (24.081 ± 2.157) and (34.551 ± 2.133) L·min⁻¹·kg⁻¹ for CL/F; (813.567 ± 60.558) and (567.385 ± 34.923) mg·min·L⁻¹ for AUC(0-t); (835.850 ± 1.393) and (580.693 ± 35.753) mg·min·L⁻¹ for AUC(0-∞); (8.544 ± 0.410) and (5.833 ± 0.342) mg·L⁻¹ for Cmax, respectively. Further, the ratio of cortisone/cortisol in two groups was (0.10 ± 0.01) versus (0.07 ± 0.02). Those results indicated that the pharmacokinetic profiles of cortisol were changed by GA, which was related to its inhibition effect on 11β-HSD2.