



## The Effects of Glycyrrhetic 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 glycyrrhetic 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 glycyrrhetic 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 11 $\beta$ -hydroxysteroid dehydrogenase 2 (11 $\beta$ -HSD2). The pharmacokinetic parameters of cortisol in the two groups were: (60.081  $\pm$  10.705) and (61.086  $\pm$  4.313) min for  $t_{1/2\beta}$ ; (24.081  $\pm$  2.157) and (34.551  $\pm$  2.133) L $\cdot$ min<sup>-1</sup> $\cdot$ kg<sup>-1</sup> for CL/F; (813.567  $\pm$  60.558) and (567.385  $\pm$  34.923) mg $\cdot$ min $\cdot$ L<sup>-1</sup> for AUC<sub>(0-t)</sub>; (835.850  $\pm$  1.393) and (580.693  $\pm$  35.753) mg $\cdot$ min $\cdot$ L<sup>-1</sup> for AUC<sub>(0- $\infty$ )</sub>; (8.544  $\pm$  0.410) and (5.833  $\pm$  0.342) mg $\cdot$ L<sup>-1</sup> for C<sub>max</sub>, respectively. Further, the ratio of cortisone/cortisol in two groups was (0.10  $\pm$  0.01) versus (0.07  $\pm$  0.02). Those results indicated that the pharmacokinetic profiles of cortisol were changed by GA, which was related to its inhibition effect on 11 $\beta$ -HSD2.

**KEY WORDS:** Cortisol, Glycyrrhetic acid, HPLC, 11 $\beta$ -hydroxysteroid dehydrogenase.

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