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Study on the effect of Folic acid on the plasma concentration of corticosterone and the ratio of corticosterone to its metabolite dehydrocorticosterone in the chronic unpredictable mild stress (CUMS)-induced depressive rat by HPLC

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T his experiment aims to develop a high performance liquid chromatography method for the determination of corticosterone and its metabolite dehydrocorticosterone as well as the ratio of corticosterone to dehydrocorticosterone in the plasma, in order to explore the effect of Folic acid on the chronic unpredictable mild stress (CUMS)-induced depressive rat.

Methods: 18 rats were randomly divided into control group, model group (chronic Stimulation) and Folic acid group (n = 6). For both model and Folic acid group, rats were treated simultaneously with CUMS for 30 days. After stimulation 75mg/kg Folic acid was given to Folic acid group 1 hour before behavior tests. After decapitation, the concentration of corticosterone and dehydrocorticosterone in plasma were simultaneous measured by HPLC. The HPLC column was Diamonsil Cl8(4.6 mm×150 mm,5 μ m) The mobile phase was acetonitrile(0.1% trifluoroacetic acid)-water (0.1% trifluoroacetic acid) and the flow rate was 0.8 mL/min. The UV detection wavelength was 246 nm.

Results: Excellent liner relationship was obtained from the corticosterone conentration from 0.02μ g/mL to 10μ g/mL (r=0.9997), and the detection limit was 0.02μ g/mL. The calibration curve of was dehydrocorticosterone was linear in the concentration range of 0.05μ g/mL to 6.0μ g/mL (r=0.9995), and the detection limit was 0.05μ g/mL. Before treatment with Folic acid, the plasma corticosterone levels, the ratio of corticosterone/ dehydrocorticosterone were significantly higher and plasma dehydrocorticosterone levels were significantly lower in model group than in control group (P<0.01).

Conclusion: The method is simple, accurate and can be used to determine the concentrations of corticosterone and its metabolite dehydrocorticosterone. This method can be applied to explore the mechanism of Folic acid on the CUMS depression.

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