

Pharmacokinetic Comparisons of Morroniside in Rats after Oral Administration of Pure Morroniside, Fructus Corni Extract and Liuwei Dihuang Pills

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SUMMARY. Liuwei Dihuang is a typical Traditional Chinese Medicine prescription with the effect of nourishing “Kidney-Yin”. It has many chemical constituents, and morroniside was one of the main bioactive constituent. But whether other ingredients can influence the pharmacokinetics of morroniside has not been reported. The aim of this study was to compare the pharmacokinetics of morroniside in rats after oral administration of pure morroniside, Fructus Corni extract and Liuwei Dihuang pills and explore the influence of other herbal ingredients in Liuwei Dihuang Pills on the pharmacokinetics of morroniside. Eighteen Wistar rats were randomly divided into three groups and orally administrated with morroniside water solution, Fructus Corni extract and LW pills CMC-Na suspension at a dosage of 20 mg/kg, respectively. Venous blood samples were collected through jugular sinus before and 0.083, 0.167, 0.25, 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24 h after administration. Plasma concentration of morroniside was determined using a simple and rapid LC-MS method. The parameters were calculated using Drug and Statistical Software-Version 2.1.1 and unpaired Student’s t-test was used for the statistical comparison. A bimodal phenomenon was observed in the plasma profile after oral administration of LW pills. The results showed that among calculated parameters, AUC_{0-t} , $AUC_{0-\infty}$, MRT_{0-t} , $t_{1/2}$, CL and V, there were significant differences between LW pills group and pure morroniside group ($P < 0.05$). But there were no significant differences between Fructus Corni extract group and pure morroniside. Some ingredients of other herbal in LW prescription may influence the elimination and bioavailability of morroniside.

RESUMEN. Liuwei Dihuang es una receta típica de la medicina tradicional china con el efecto de nutrir el riñón. Tiene muchos componentes químicos y la morronisida fue uno de los principales constituyentes bioactivos. Pero no se ha informado si otros ingredientes pueden influir en la farmacocinética de la morronisida. El objetivo de este estudio fue comparar la farmacocinética de morronisida en ratas después de la administración oral de morronisida pura, extracto de Fructus Corni y píldoras Liuwei Dihuang y explorar la influencia de otros ingredientes herbales en las píldoras Liuwei Dihuang sobre la farmacocinética de la morronisida. Dieciocho ratas Wistar se dividieron aleatoriamente en tres grupos y se administraron por vía oral con solución acuosa de morronisida, extracto de Fructus Corni y suspensión de LMC de pastillas de LW a una dosis de 20 mg/kg, respectivamente. Se recogieron muestras de sangre venosa a través del seno yugular antes y 0.083, 0.167, 0.25, 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24 h después de la administración. La concentración plasmática de morronisida se determinó usando un método simple y rápido de LC-MS. Los parámetros se calcularon usando Drug and Statistical Software-Version 2.1.1 y se utilizó la prueba t de Student para la comparación estadística. Se observó un fenómeno bimodal en el perfil de plasma después de la administración oral de píldoras LW. Los resultados mostraron que entre los parámetros calculados, AUC_{0-t} , $AUC_{0-\infty}$, MRT_{0-t} , $t_{1/2}$, CL y V hubo diferencias significativas entre el grupo de píldoras LW y el grupo de morronisida pura ($P < 0.05$). Pero no hubo diferencias significativas entre el grupo de extracto de Fructus Corni y la morronisida pura. Algunos ingredientes de otras hierbas en la prescripción LW pueden influir en la eliminación y la biodisponibilidad de morronisida.

KEY WORDS: comparison, Fructus Corni, LC-MS, Liuwei Dihuang, morroniside, pharmacokinetic.

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