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Determining Concentrations of Loganin in Plasma of Rat by UPLC-MS/MS Method: Applications for a Pharmacokinetic Study

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***SUMMARY*. Loganin, the main effective iridoid glycoside derived from *Cornus officinalis,* has been used for various medicinal purposes in traditional Chinese medicine for centuries. In this work, we developed a simple and fast ultra-high performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS) method for determinating the plasma levels of loganin in rats. After addition of internal standard (IS), protein precipitation with acetonitrile was used for sample treatment. Sample separation was achieved on an Acquity UPLC BEH C18 column with an acetonitrile and 0.1% formic acid mobile phase. Multiple reactions monitoring (MRM) mode was used for quantification, m/z 434.9→227.0 for loganin, and m/z 579.2→271.1 for IS, in electrospray ionization source with negative ion mode. The assay was linear over the range of 2-2000 ng/mL for loganin. RSD of precision were no more than 13%. Mean recoveries of loganin ranged from 92.9 to 95.6% and its accuracies were in the range of 89.3 to 109.6%. The bioavailability of loganin was 19.6%. Our method was successfully applied to pharmacokinetics of loganin after intravenous (2 mg/kg) and oral (15 mg/kg) administration in rats.**

RESUMEN. Loganina, el principal glucósido iridoide derivado de *Cornus officinalis,* se ha utilizado durante varios siglos con diversos fines en la medicina tradicional china. En este trabajo, desarrollamos un método simple y rápido de ultra-alta resolución de cromatografía líquida-espectrometría de masas en tándem (UPLC-MS/MS) para determinar los niveles plasmáticos de loganina en ratas. Después de la adición del estándar interno (IS), se usó la precipitación de proteínas con acetonitrilo para el tratamiento de la muestra. La separación de muestras se logró en una columna Acquity UPLC BEH C18 con una fase móvil de acetonitrilo y ácido fórmico al 0,1%. Se usó el modo de monitorización de reacciones múltiples (MRM) para la cuantificación, m/z 434.9→227.0 para loganina y m/z 579.2→271.1 para IS, en fuente de ionización o electropulverización con modo ión negativo. El ensayo fue lineal en el rango de 2-2000 ng/mL para loganina. La RSD de precisión no fue más del 13%. Las recuperaciones medias de loganina variaron de 92.9 a 95.6% y sus precisiones estuvieron en el rango de 89.3 a 109.6%. La biodisponibilidad de la loganina fue del 19,6%. Nuestro método se aplicó con éxito a la farmacocinética de loganina después de la administración intravenosa (2 mg/kg) y oral (15 mg/kg) en ratas.

KEY WORDS: loganin, pharmacokinetics, plasma, UPLC-MS/MS.

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