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Pharmacokinetics and Tissue Distribution Study of Gambogic Acid and Gambogic Acid Nanosuspension in Mice by UHPLC–MS/MS

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***SUMMARY*. The objectives of this study were to investigate the tissue biodistribution and pharmacokinetic properties of gambogic acid nanosuspension (GA-NS) with that of gambogic acid solution (GA-S) after intravenously administration to mice. A simple and rapid UHPLC method for determination of GA-NS presented in plasma and tissue has been developed and validated. The method was successfully applied to the pharmacokinetic and tissue distribution study of GA-NS in mice. The results of the pharmacokinetic research demonstrated that the $AUC_{0\sim\infty}$values of GA-NS were 4.73 times greater than GA-S. It could clearly be seen that the nanosuspension reservoir was formed in circulation, released slowly drug and prolong circulation time *in vivo*. The tissue distribution studies revealed that GA-NS markedly improved the concentrations of GA in liver and reduced the concentrations in heart and had more significant liver targeting characteristics compared with GA-S.**

RESUMEN. Los objetivos de este estudio actual fueron investigar la biodistribución en tejidos y las propiedades farmacocinéticas de la nanosuspensión de ácido gambógico (GA-NS) con las de la solución de ácido gambógico (GA-S) después de la administración intravenosa a ratones. Se ha desarrollado y validado un método de UHPLC simple y rápido para la determinación de GA-NS en plasma y tejidos. El método se aplicó con éxito al estudio farmacocinético y a la distribución tisular de GA-NS en ratones. Los resultados de la investigación farmacocinética demostraron que los valores $AUC_{0\sim\infty}$ de GA-NS eran 4,73 veces mayores que los de GA-S. Se pudo ver claramente que el depósito de la nanosuspensión se formó en la circulación, liberó lentamente el fármaco y prolongó el tiempo de circulación *in vivo*. Los estudios de distribución tisular revelaron que GA-NS mejoró notablemente las concentraciones de GA en el hígado y redujo las concentraciones en el corazón y tuvo características más significativas de selección del hígado en comparación con GA-S.

KEY WORDS: gambogic acid, nanosuspension, pharmacokinetics, tissue distribution, UHPLC-MS/MS.

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