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HPLC测定大鼠血浆中阿魏酸的浓度及其药动学研究

Determination of Ferulic Acid in Rat Plasma by HPLC and Its Application in Pharmacokinetics Studies

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作者	单位	E-mail
俞静静	浙江中医药大学，杭州 310053	yujingjing8223@163.com
楼招欢	浙江中医药大学，杭州 310053	
陈素红	温州医科大学，浙江 温州 325035	
颜美秋	浙江中医药大学，杭州 310053	
吕圭源*	浙江中医药大学，杭州 310053	lv.gy@263.net

中文摘要：

目的 建立测定大鼠血浆中阿魏酸的反相高效液相色谱法，并测定灌胃给予康脉心口服液(Kangmaixin oral liquid，KMX)后大鼠血浆中阿魏酸的浓度及药动学参数。方法 血浆样品经酸化后用乙酸乙酯进行液-液萃取，色谱柱为Diamonsil TM C_{18}(4.6 mm×250 mm，5 μm)，Agilent C_{18}预柱；流动相为乙腈-0.085% H_3PO_4溶液(17∶83)；流速1.0 mL·min^{-1}；DAD检测波长316 nm；柱温35 ℃。测定KMX灌胃后阿魏酸在大鼠体内的血药浓度，建立阿魏酸药时曲线，并对其进行房室模型的拟合和药动参数的计算。结果 阿魏酸在0.137 04~5.710 μg·mL^{-1}内具有良好的线性关系(r=0.999 8)，最低定量限为6.852 ng；样品溶液在36 h内稳定，精密度良好(RSD<5.0%)；平均回收率为91.8%~100.5%。阿魏酸在大鼠体内过程符合二室模型，T_{max}=20.10 min，C_{max}=743.6 ng·mL^{-1}，$T_{1/2Ka}$=6.781 min，$T_{1/2\alpha}$=17.82 min，$T_{1/2\beta}$=179.4 min。结论 该方法简便、灵敏度高，无杂质干扰，可用于KMX中阿魏酸的药动学研究，其中阿魏酸在大鼠体内吸收分布迅速而消除慢。

英文摘要：

OBJECTIVE To develop a high-performance liquid chromatography for determination of ferulic acid(FA) in rats plasma which were treated with Kangmaixin oral liquid(KMX)

and to study the pharmacokinetics of FA in rats. METHODS Plasma sample were extracted by liquid-liquid extraction with ethylacetate. Diamonsil TM C_{18}(4.6 mm×250 mm, 5 μm) chromatographic column and Agilent C_{18} pre-column was used with 35 ℃ column temperature. The mobile phase consisted of acetonitrile and 0.085% phosphoric acid (17∶83). The flow rate was 1.0 mL·min^{-1}. The detection wavelength was set at 316 nm. The plasma concentration of FA in rat plasma after i.g. KMX was determined. The plasma concentration-time curve of FA was plotted, the compartment model was fitted and the pharmacokinetic parameters were calculated. RESULTS The assay showed good linear correlation over the range of 0.137 04-5.710 μg·mL^{-1}(r=0.999 8). The minimum quantity limit of FA was 6.852 ng. The sample solution was stable within 36 h. The coefficient variation of precision was <5.0%. The average recovery rate of this method was 91.8%-100.5%. FA in rats fit to two-compartment model with T_{max}=20.10 min, C_{max}=743.6 ng·mL^{-1}, $T_{1/2Ka}$=6.781 min, $T_{1/2\alpha}$=17.82 min, $T_{1/2\beta}$=179.4 min. CONCLUSION The method is simple, sensitive and suitable for pharmacokinetics of FA, and FA can be absorbed and distributed very rapidly while the elimination is very slow after taken KMX.

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