

论文

LC-MS/MS法测定豚鼠毛发中可卡因及其代谢物苯甲酰爱康宁

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摘要:

本实验旨在建立豚鼠毛发中可卡因及其代谢物苯甲酰爱康宁的液相色谱-串联质谱分析方法, 并考察单次给药后豚鼠毛发中可卡因和苯甲酰爱康宁的质量浓度。毛发洗涤、晾干后剪成1~2 mm小段, 取20 mg, 加入0.1 mol·L<sup>-1</sup> HCl 1 mL和内标溶液(50 ng·mL<sup>-1</sup> D<sub>3</sub>-可卡因和D<sub>8</sub>-苯甲酰爱康宁) 20 μL, 50 °C水浴中酸水解过夜; 调pH为中性, 用二氯甲烷液液提取, 移取有机相于60 °C水浴下挥干, 用甲醇100 μL复溶, 进样5 μL。目标化合物用Allure PFP丙基柱分离, 以甲醇-20 mmol·L<sup>-1</sup> 乙酸铵(0.1%甲酸)(80:20)为流动相。质谱采用电喷雾电离-正离子模式(ESI+), 多反应监测模式(MRM)。动物实验: 豚鼠8只分两组, 分别以10和0.4 mg·kg<sup>-1</sup>的剂量腹腔注射盐酸可卡因水溶液一次, 在给药后d 7和d 14分色剃取毛发进行检测。结果显示, 毛发中可卡因和苯甲酰爱康宁的最低检出限均为1 pg·mg<sup>-1</sup>, 在5~250 pg·mg<sup>-1</sup>线性良好( $r^2 \geq 0.9997$ )。在给药后d 7收集的豚鼠毛发中同时检测到可卡因和苯甲酰爱康宁; d 14收集的毛发中只检测到可卡因。所建LC-MS/MS法灵敏度高, 特异性强, 适用于豚鼠毛发中低质量浓度的可卡因和苯甲酰爱康宁的分析。

关键词: 可卡因 苯甲酰爱康宁 LC-MS/MS 单次给药 毛发分析

Determination of cocaine and benzoylecgonine in guinea pig's hair after a single dose administration by LC-MS/MS

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Abstract:

A sensitive LC-MS/MS method to determine cocaine and its major metabolite benzoylecgonine in guinea pig's hair has been established. About 20 mg of decontaminated hair sample was hydrolyzed with 0.1 mol·L<sup>-1</sup> HCl at 50 °C overnight, in the presence of cocaine-D<sub>3</sub> and benzoylecgonine-D<sub>8</sub> used as internal standards, and then extracted with dichloromethane. The analysis was performed by liquid chromatography-tandem mass spectrometry (LC-MS/MS). Positive electrospray ionization (ESI+) and multiple reactions monitoring (MRM) mode were used. The limit of detection (LOD) for cocaine and benzoylecgonine was 1 pg·mg<sup>-1</sup>. The calibration curves of extracted standards were linear over the range from 5 pg·mg<sup>-1</sup> to 250 pg·mg<sup>-1</sup> ( $r^2 \geq 0.9997$ ). The method was validated and applied to the analysis of guinea pig's hair after a single dose administration of cocaine hydrochloride. Cocaine and benzoylecgonine were not only detected, but also quantified in guinea pigs hair.

Keywords: benzoylecgonine LC-MS/MS single dose hair cocaine

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