



A LC-MS/MS Method for Simultaneous Quantification of Levodopa and Istradefylline for Parkinson's Disease and Application to a Pharmacokinetic Study

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SUMMARY. In this study, a simple and sensitive ultra performance liquid chromatography tandem mass spectrometry (UPLC-MS/MS) method is developed and validated for determination of levodopa and istradefylline in rat plasma samples using 8-(3-chlorostyryl) caffeine as the internal standard (IS). Sample preparation was accomplished through a simple protein precipitation with methanol, and chromatographic separation was performed on an Acquity UPLC BEH C18 column (2.1 × 50 mm, 1.7 μm) with the mobile phase of acetonitrile and 0.2% formic acid in water with gradient elution at a flow rate of 0.40 mL/min. The linearity of this method was found to be within the concentration range of 25-5000 ng/mL for levodopa, and within the concentration range of 10-5000 ng/mL for istradefylline in rat plasma. The intra- and inter-day precision and accuracy were acceptable. Only 3.5 min was needed for an analytical run. The method was applied to a pharmacokinetic study of levodopa and istradefylline in rats.

RESUMEN. En este estudio se desarrolla y valida un método de espectrometría de masa en tándem con cromatografía líquida ultrarrápida (UPLC-MS/MS) simple y sensible para la determinación de levodopa e istradefilina en muestras de plasma de rata utilizando 8-(3-cloroestiril) cafeína como estándar interno (IS). La preparación de la muestra se llevó a cabo a través de una simple precipitación de proteínas con metanol y se realizó una separación cromatográfica en una columna Acquity UPLC BEH C18 (2,1 × 50 mm, 1,7 μm) con la fase móvil de acetonitrilo y 0,2% de ácido fórmico en agua con gradiente de elución a un caudal de 0,40 mL/min. La linealidad de este método se encontró dentro del rango de concentración de 25-5000 ng/mL para levodopa y de 10-5000 ng/mL para istradefilina en plasma de rata. La precisión y exactitud intra- e inter-día fueron aceptables. Sólo se necesitan 3,5 min para una ejecución analítica. El método se aplicó a un estudio farmacocinético de levodopa e istradefilina en ratas.

KEY WORDS: istradefylline, levodopa, pharmacokinetic, UPLC-MS/MS.

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