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A rapid UPLC-MS/MS Method for Determination of Lorazepam in Human Plasma and its Application to Pharmacokinetic Study

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***SUMMARY*. In this study, a simple, rapid and sensitive ultra performance liquid chromatography tandem mass spectrometry (UPLC-MS/MS) method is described for the determination of lorazepam in human plasma samples using diazepam as the internal standard (IS) for pharmacokinetic assays. Sample preparation was accomplished through protein precipitation with acetonitrile, and chromatographic separation was performed on an Acquity BEH C18 column (2.1 × 50 mm, 1.7 μm) with gradient profile at a flow of 0.40 mL/min. Mass spectrometric analysis was performed using a QTrap5500 mass spectrometer coupled with an electro-spray ionization (ESI) source in the positive ion mode. The linearity of this method was found to be within the concentration range of 1-100 ng/mL for lorazepam in human plasma. Only 2.0 min was needed for an analytical run. The method was applied to a pharmacokinetic study of lorazepam in healthy human subjects.**

RESUMEN. En este estudio se describe un método simple, rápido y sensible de cromatografía líquida de ultra desempeño con espectrometría de masas en tándem (UPLC-MS/MS) para la determinación de lorazepam en muestras de plasma humanos utilizando diazepam como estándar interno (IS) a partir de ensayos farmacocinéticos. La preparación de la muestra se llevó a cabo a través de la precipitación de proteínas con acetonitrilo y la separación cromatográfica se realizó en una columna Acquity BEH C18 (2,1 × 50 mm, 1,7 μm) con perfil de gradiente a un caudal de 0,40 mL/min. Se realizó un análisis de espectrometría de masas usando un espectrómetro de masas QTrap 5500 junto con una fuente de ionización por electro-pulverización (ESI) en modo de ion positivo. Se encontró que la linealidad de este método estaba dentro del intervalo de concentración de 1-100 ng/mL para lorazepam en plasma humano. Se necesitan sólo 2,0 min para una serie de análisis. El método se aplicó a un estudio farmacocinético de lorazepam en sujetos humanos sanos.

KEY WORDS: human plasma, lorazepam, pharmacokinetics, UPLC-MS/MS.

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