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.

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