

ABSTRACT

Simple and Rapid Determination of Carboplatin in Human Plasma Ultrafiltrate Using LC/MS/MS By Direct Injection Coupled With Post Column Addition

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Purpose

To develop and validate an LC/MS/MS method for the determination of Carboplatin, an anti-cancer drug in Human Plasma Ultrafiltrate.

Methods

50 microliter of Carboplatin fortified human plasma ultrafiltrate was diluted with 100 microliter Oxaliplatin (internal standard). The mixture was directly injected onto a Metasil Inertsil ODS-2 column (2.1 x 50 mm). A single pump was utilized to deliver 0.5% acetic acid in water isocratically at 0.300 mL/min, while a second pump introduced post-column acetonitrile at .200 mL/min into the system. Endogenous components were diverted to waste using switch valve. Mass spectrometric detection was performed with a Sciex API 3000 mass spectrometer in positive ion mode with SRM transition 372/294 for Carboplatin and 398/306 for Oxaliplatin.

Results

The direct injection approach proved to be feasible and efficient. Because of instability at room temperature, post-preparative samples were maintained at 1-8C. The post-column addition of acetonitrile enhanced ionization efficiency by 40%. Furthermore, combining the post-column addition with a flow-diverting valve prevented the need for maintenance of the ESI source. Ion suppression was observed, but had no effect on the quantitation of the analyte. This LC/MS/MS assay was validated with linear range of 50-40,000 ng/mL. Validation experiments included intra- and inter-day precision and accuracy, selectivity/specificity and various stability tests. The inter-day precision and accuracy was 2 to 11.1% and -5.6 to 0.7%, respectively.

Conclusion

A simple and fast LC/MS/MS method was developed and validated. It proved to be sensitive, specific and accurate for the quantitation of Carboplatin in human plasma ultrafiltrate.