Innovative HPTLC-Densitometric Method for Therapeutic Monitoring of Meropenem and Metronidazole in Acute Pancreatic Patients

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Abstract:

Meropenem (MRP) and metronidazole (MTZ) are anti-microbial agents that concomitantly administered for the management of severe acute pancreatic patients. An innovative direct, simple, rapid, cost effective and sensitive high performance thin layer chromatographic (HPTLC) method was successfully developed for in vitro and in vivo simultaneous determination of MRP and MTZ. The developed method relied on direct spotting of plasma without any pre-treatment due to low plasma protein binding of studied drugs followed by chromatographic separation and UV detection at isoabsorptive point of both drugs (306 nm). Chromatographic separation was done by methanol: acetonitrile: water (10:10:5, v/v/v) using formic acid as pH modifier. The Rf values were 0.55 ± 0.03 and 0.84 ± 0.02 for MRP and MTZ, respectively. Under optimum conditions, a linear relationship was obtained in concentration range of 100–1000 and 10–250 ng band⁻¹ for MRP and MTZ, respectively with good correlation coefficient 0.9994–0.9997. The detection limits were 33.13 and 3.17 ng band⁻¹ for MRP and MTZ, respectively. The method was validated according to ICH and US-FDA guidelines. The developed method was successfully applied for in vitro and in vivo quantification of MRP and MTZ in spiked human plasma and real plasma of acute pancreatic patients, respectively. Furthermore, the method was applied for assay of individual dosage forms of both drug.

Keywords:

Meropenem, Metronidazole, HPTLC spectrodensitometry, Acute pancreatitis, Real patient's plasma sample, Pharmaceutical dosage forms

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