Development and Validation of a High Performance Liquid Chromatography-Mass Spectrometry for the Determination of Acetaminophen in Human Plasma

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Paracetamol or acetaminophen (N-acetyl-p-aminophenol) is a widely used analgesic. Study of paracetamol metabolism is important in toxicological and pharmacokinetic studies of the drug [1]. Paracetamol is an effective and safe agent used to reduce fever, cough, cold and moderate pain including instances of tension headache, migraine headache, muscular aches, general pain and toothache for the analgesic. It is also useful in osteoarthritis therapy and management of cancer pain [2].

Acetaminophen separation was done with reversed-phase ACE C18 column. The mobile phase contained a mixture of acetonitrile-water (80:20, v/v; with 0.1% formic acid). The detection was operated in electrospray ionization (ESI) using multiple mode source and m/z 152.1 for acetaminophen. In this study, a simple, rapid and accurate method for determination of acetaminophen in human plasma was established. The primary stock solutions of acetaminophen and etodolac (IS) were prepared in acetonitrile (100 μg/mL). Acetaminophen working solution was used to prepare the spiking stock solutions for construction of six-point calibration curve (100–10000 ng mL⁻¹) and QC samples at three different levels (250, 4500, 9000 ng mL⁻¹).

The method achieved good sensitivity and specificity for the determination of acetaminophen in human plasma. No significant interference caused by endogenous compounds was observed. This method is suitable for the pharmacokinetic studies and therapeutic drug monitoring of acetaminophen in human plasma.

REFERENCES