Simultaneous determination of tramadol, O-desmethyltramadol and N-desmethyltramadol in human urine by gas chromatography–mass spectrometry

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Abstract:

Analytical procedures for the determination of tramadol (T), O-desmethyltramadol (ODT), and N-desmethyltramadol (NDT) in human urine have been developed and validated using gas chromatography–mass spectrometry (GC/MS). Sample preparation involved liquid-liquid extraction with methyl-tert-butyl ether (MTBE) and followed by back extraction with 0.1 M hydrochloric acid. Proadifen (SKF525A) was selected as internal standard (IS). Extraction efficiencies of T, ODT and NDT were 102.12, 101.30, and 98.21%, respectively. The calibration curves were linear (r2 > 0.99) in the concentration range 10–1000 ng/mL for all compounds. Limits of quantification (LOQ) were 10, 10 and 20 ng/mL for T, ODT and NDT, respectively. Intra-assay precision was within 1.29–6.48% and inter-assay precision was within 1.28–6.84% for T, ODT and NDT. Intra-assay accuracy was within 91.79–106.89% for all analytes. This method detected urine concentrations of T, ODT and NDT in six healthy volunteers for 7 days after administration of 50 mg oral doses of tramadol.

Keywords:

Tramadol O-Desmethyltramadol N-Desmethyltramadol Urine GC/MS Validation

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