

HISTORICAL DRUGS OR A CURRENT PROBLEM? DETERMINATION OF METHAQUALONE AND ITS ANALOGS IN BIOLOGICAL MATERIAL BY UHPLC-QqQ-MS/MS

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Introduction: Methaqualone was introduced to the market in the 1960s' as a sedative-hypnotic drug, intended as an alternative to compounds in the barbiturate group. Due to its side effects, as well as increasing recreational use, methaqualone and its analogs, synthesized for medical purposes, were withdrawn from the market or never appeared on the market as pharmaceutical products. Given the current state of the market for new psychoactive substances, the high level of interest in methaqualone and its analogs on dedicated online forums suggests a significant risk that their abuse could become more widespread in the coming years.

Methods: A ultra-high-performance liquid chromatography triple quadrupole tandem mass spectrometry (UHPLC-QqQ-MS/MS) method was developed to simultaneously determine 9 compounds from methaqualone group. Biological specimens were prepared using liquid-liquid extraction (LLE) with the use of ethyl acetate in pH 9. Quantification of those xenobiotics was performed in blood in multiple reaction monitoring (MRM) mode. Methaqualone-d7 served as an internal standard. The limit of quantification (LOQ) of the method was 0.1 or 0.2 ng/mL depending on the substance; precision and accuracy values did not exceed $\pm 20\%$. Recovery of the method was in the range of 84.2-113.7%.

Results: The developed method allowed chromatographic separation of all 9 compounds tested from the methaqualone group with satisfactory validation parameters. Moreover, the fragmentation mass spectra presented may contribute to the ability to detect these compounds in routine toxicological analysis.

Conclusions: The described situation poses a significant problem from the analytical point of view, as well as interpretation and forensic toxicological expertise. The developed method will contribute to increased analytical capabilities and enhanced detection of compounds from the methaqualone group that may appear on the illicit market.

Key words: Methaqualone; new psychoactive substances; sedative-hypnotic compounds; UHPLC-QqQ-MS/MS

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