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Chemical-toxicological examination of promedol in urine

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Abstract

Promedol (Trimeperidine) was synthesized in the Soviet Union and is one of the most widely used drugs from the pharmacological group of narcotic analgesics in Russia and the countries of the former Soviet Union. Domain of application of the drug is very wide. But despite the fact that this medical product has been used for a long time, it has not been studied chemically and toxicologically and its metabolism has not been studied yet, nor have exact concentrations of its content in urine, blood, organs been monitored or described after taking therapeutic doses and after overdoses. Most often, cases of overdoses include non-medical use of this analgesic, or uncontrolled use by medical personnel. An important aspect is the correct interpretation of the results of the study of biological material. The main way of metabolizing Promedol is the dealkylation of the piperidine cycle with formation of a demethylated metabolite, norpromedol. A correct evaluation of the results of a chemical-toxicological study of biological material from a living person or a forensic chemical examination of a corpse makes it possible to differentiate the use of a medicinal product of Promedol from the non-medical use of the drug Alphaprodine, whose trafficking is prohibited in the territory of the Russian Federation. This article describes the method of chemical-toxicological study of biological material (urine) for the qualitative detection of Promedol and its metabolite, as well as for the quantitative determination of Promedol. The study was conducted on urine samples from patients who had once been administered a therapeutic dose of Promedol and estimated the amount of Promedol in process of its elimination. The most effective chromatographic systems and reagents for detecting the zones of Promedol by chromatography in a thin layer of sorbent were selected and the coefficients of chromatographic mobility (Rf-values) for Promedol in different solvent systems were determined. The study of Promedol was carried out by UV spectroscopy, IR spectroscopy and gas chromatography-mass spectrometry. Optimal conditions for sample preparation for the study of Promedol by gas chromatography-mass spectrometry were selected.

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