

Chemical-toxicological study of amitriptyline in urine

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Abstract

Among all antidepressants, the preparations of the tricyclic antidepressant group are most widely used in the territory of the Russian Federation. Amitriptyline is the most popular among the medicinal product of this group. The one acts as thymoleptic, antidepressant, anxiolytic, sedative agent. This preparation inhibits reuptake of neuromediators (noradrenaline, serotonin) with presynaptic neural endings of neurons and causes accumulation of monoamines in the synaptic cleft, and enhances postsynaptic input. With prolonged use, the one reduces functional activity (desensitization) of beta-adrenergic, serotonin receptors of the brain, normalizes adrenergic and serotonergic transmission, and restores these systems balance, disturbed during depressive states. This preparation blocks m-choline- and histamine receptors of the central nervous system. The range of therapeutic use of the preparation accounts for relatively large number of persons, taking it, and in turn, a rather large percentage of poisoning occurrence, among other things fatal, with this substance. The cases of accidental poisoning, in case of non-compliance with the recommended dosages and suicidal poisoning are the most common. The most part of preparation-administered dose is excreted, so urine is an important object in the following: chemico-toxicological analysis, chemical evidence in court and doping control. In this paper, the method of isolating and extracting of amitriptyline from urine in connection with TOXI-PROBES ready-made extraction tubes, which have a combined extraction fluid, and permitting to do sample purification simultaneously with extraction, is used. The most effective systems for amitriptyline separation by chromatography in a thin layer of sorbent were picked up, the values of R_f in various solvent systems were calculated, and reagents for staining were picked up. Amitriptyline spectra were obtained by means of different physicochemical methods (UV-spectroscopy, gas chromatography-mass spectrometry). The concentrations of amitriptyline while therapeutic administration of this preparation, as well as the concentrations in overdoses were calculated by chromatography-mass spectrometry. High concentrations of the preparation were correlated with severity of poisoning; the complications have taken place after intoxication. All observed cases had a relatively favorable treatment outcome, but with failure to provide medical attention or untimely delivery of care, the fatality is possible.

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