AM-o-17

Determination of a designer drug 1-(3-chlorophenyl) piperazine (mCPP) and its parent compound trazodone in hair by High-Performance Liquid Chromatography–Electrospray Mass Spectrometry (HPLC–ESI-MS)

ROMAN STANASZEK and WOJCIECH LECHOWICZ

Institute of Forensic Research, ul. Westerplatte 9, 31-033 Cracow, Poland

AIM: The aim of this study was to develop, optimise and validate an analytical procedure to determine 1-(3-chlorphenyl)piperazine (mCPP) together with its parent compound trazodone in hair. mCPP is an active metabolite of a common antidepressant trazodone. Although mCPP, a piperazine-derived designer drug is still a legal substance in most countries it has been detected in seizures of ecstasy tablets on the drug scene. It shows stimulant and hallucinogenic effects similar to those of MDMA and its abuse must be considered.

METHODS: The target substances were extracted from 50 mg hair, with 1-chlorobutane after alkaline digestion (0.5M NaOH, 1h, 70°C) and analysed underivatised with high-performance liquid chromatography-electrospray ionisation mass spectrometry (LC–ESI-MS). ESI-MS parameters such as capillary voltage, cone voltage, source temperature, desolvation temperature and desolvation gas flow were optimised with the application of direct inlet method. The optimised values were as follows respectively: CV – 3 kV, CNV – 45V, ST – 100°C, DT – 300°C, DGF – 600 L/H. Quantification was performed using selected ion recording (SIR) of positive molecular ions of the studied drugs (m/z - 197 for mCPP and m/z – 372 for trazodone), and deuterated ketamine (m/z – 242) used as internal standards. Additional two ions m/z 199, 154 for mCPP and 374, 176 for trazodone were used for identification.

RESULTS: The limits of detection (LOD) were 0.1 ng/mg hair for mCPP and 0.02 ng/mg for trazodone. A linear response was observed for the two drugs from 0 to 5 ng/mg hair. Other validation parameters such as intra-assay precision (at low level 0.5 ng/mg: CV 6.5% for mCPP and 14.0% for trazodone, at high level 2 ng/mg: CV 5.3% for mCPP and 10.1% for trazodone), recovery (70% – mCPP, 129% – trazodone, at 2 ng/mg) were also determined and were satisfactory.
The method was applied to the determination of mCPP and trazodone in 7 authentic hair. A single administration of 80 mg of trazodone gave the following concentrations in hair sample collected one month after: 1st (1 cm) segment 5.93 ng/mg for trazodone and 0.1 ng/mg for mCPP; 2nd (1 cm) segment 0.04 ng/mg for trazodone and mCPP was not detected. Six remaining samples were negative.

CONCLUSION: The developed hair analysis method can be applied for differentiation of an intake of mCPP from that of its precursor drug trazodone and others even in cases of a single administration.

KEYWORDS: *mCPP, Hair analysis, LC-MS*

Corresponding author: rstanasz@ies.krakow.pl