Emerging Designer Drug Monograph

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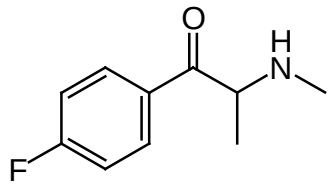
Drug Name: Flephedrone

Synonyms: 4'-Fluoromethcathinone (4-FMC); *para*-fluoromethcathinone; 2-methylamino-1-(4-fluorophenyl)-propan-1-one. Positional isomers 3'-fluoromethcathinone (3-FMC) and 2'-fluoromethcathinone (2-FMC) sometimes sold under generic names flephedrone and fluoromethcathinone (FMC). Usually supplied as hydrochloride

Structure:



Formula: $C_{10}H_{12}FNO$

Molecular Weight: 181.2

Pharmacological Drug Class: Flephedrone is assumed to be a potent stimulant (1) similar to classic cathinones and their designer analogs.

Metabolism: Metabolism of 3-fluoromethcathinone (3-FMC) was studied in vitro with human liver microsomes and in vivo in rat urine (2). *N*-demethylated and keto- reduced products (alcohols) were found as main metabolites. Conjugated hydroxylation products in the aromatic system were also found (2). Another study of 3-fluoromethcathinone metabolism in vitro with rabbit liver slices (3) found 3-fluorocathinone, 3-fluorocathinone-imine hydroxy-3-fluoromethcathinone and 3-fluoromethcathinone-diol as major metabolites. A combination of 4-fluoroephedrine, 4-fluronorephedrine and their *pseudo*- isomers were found in the multiple random human urine samples after presumed administration of flephedrone (4).

Blood Concentrations: Severe psychosis, agitation, bizarre suicidal behavior and hallucinations in a young man were reported (5) resulting from the use of bath salt product containing 143 μg of 3,4-methylenedioxypyrovalerone (MDPV) and 142 μg of flephedrone per mg powder. MDPV and flephedrone levels in serum were 186 and 346 ng/mL respectively. In urine MDPV concentration was 136 ng/mL, flephedrone - 257 ng/mL. The symptoms were eventually resolved with lorazepam and droperidol.

Effects and Toxicity: On the drug forums, the users report effects comparable to MDMA and mephedrone (5). Flephedrone is usually administered orally, nasally or rectally over 2 -4 hour period in divided doses totaling 200-700 mg. Some users find flephedrone less pleasurable, more addictive and "toxic" than mephedrone and methylone. Fatigue, sleep deprivation and loss of appetite are the common after effects, similar to other cathinones.

Analysis: Free flephedrone reduced metabolites in urine, 4-fluoroephedrine, 4-fluronorephedrine and their *pseudo* isomers were detected by GC/MS after basic liquid/liquid extraction and TFA derivatization (4). Parent flephedrone was less abundant, than metabolites, or not detected (4). GC/MS and LC-high-resolution MS were used to detect flephedrone reduced and hydroxylated metabolites in urine of a suspected recreational user (2).

The recreational use of flephedrone was first reported in 2009 (6). In the US in a two year (2011 – 2012) study, 58 out of 34561 random urine samples (0.17%) were found positive for flephedrone metabolites (4).

References:

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3. Pawlik, E., Plässer, G., Mahler, H., Dalrup, T. (2012) Studies on the phase I metabolism of the new designer drug 3-fluoromethcathinone using rabbit liver slices. *International Journal of Legal Medicine* 126(2), 231 - 240.

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