A FATAL CASE OF FLECAINIDE INTOXICATION


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A girl, 15 years of age with a history of suicide attempts, was found deceased. At autopsy, no anatomic cause of death was identified. Systematic toxicological analysis (EMIT, RIA, HPLC-DAD, GC-NPD, and GC-MS) of postmortem blood and urine revealed the presence of ethanol (blood: 0.14 g/L), caffeine (urine: 0.66 µg/mL), carbamazepine (blood: 0.99 µg/mL, urine: 0.09 µg/mL), tramadol (blood: 0.32 µg/mL, urine: 0.52 µg/mL), benzodiazepines (blood: 0.07 µg/mL, urine: 0.38 µg/mL) and a high concentration of flecainide and its two major metabolites meta-O-dealkylated flecainide and meta-O-dealkylated flecainide lactam (blood and urine).

Flecainide is a class IC anti-arrhythmic drug causing a decreased intracardiac conduction velocity in all parts of the heart. To identify and quantify flecainide together with its metabolites in blood, urine and other toxicological relevant matrices, a new method was developed using high performance liquid chromatography with diode array detection. All compounds were separated on a Hypersil BDS Phenyl-column using water, methanol and 1.5 M ammonium acetate in a gradient system. Chromatographic analysis was preceded by an optimised solid phase extraction procedure with RP-C18 extraction columns.

The flecainide concentrations in blood and urine were 18.73 and 28.3 µg/mL respectively, and the metabolites were detected only in urine at the following concentrations: meta-O-dealkylated flecainide 9.4 and meta-O-dealkylated flecainide lactam 8.59 µg/mL.

Based on our results and previously reported fatal flecainide intoxications (blood concentrations ranging from 3 up to 100 µg/mL), the forensic pathologists ruled that the cause of death was due to an overdose of this anti-arrhythmic drug.

Keywords: Flecainide, intoxication, liquid chromatography