A fatal case of poisoning with ethanol and psychotropic drugs with putrefactive changes

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SUMMARY

We present a fatal case involving poisoning with paroxetine, flunitrazepam, and ethanol, with putrefactive changes. Quantitative toxicological analysis showed that the concentrations of paroxetine and 7-aminoflunitrazepam, a metabolite of flunitrazepam, in the femoral blood were 0.28 μg/ml and 0.17 μg/ml, respectively. We also detected an ethanol level of 2.90 mg/ml and an n-propanol level of 0.10 mg/ml. We concluded that the cause of death was due to the interaction of paroxetine, flunitrazepam, and ethanol. The effects of putrefactive changes should be considered during forensic toxicological evaluation.

Keywords: flunitrazepam – ethanol – paroxetine – gas chromatography mass spectrometry (GC/MS).

Otrava etanolem a psychotropními látkami u případu s hnilobnými změnami

SOUHRN

Je prezentován případ smrtelné otravy paroxetinem, flunitrazepamem a etanolem v terénu hnilobných změn. Kvantitativní toxikologická analýza vykázala, že koncentrace paroxetinu a 7-aminoflunitrazepamu (metabolitu flunitrazepamu) ve vzorku femorální krve byla 0,28 μg/ml a 0.17 μg/ml. Také byla zjištěna hladina alkoholu 2,90 mg/ml a n-propanolu 0,10 mg/ml. Usuzujeme proto, že smrt nastala v důsledku vzájemné interakce paroxetinu, flunitrazepamu a etanolu. Bylo též uvažováno o vlivu hnilobných změn na forensní toxikologické vyhodnocení.

Klíčová slova: flunitrazepam – etanol – paroxetine – plynová chromatografie s hmotnostní spektrometrií (GC/MS).

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The evaluation of toxicity due to ingestion of multiple psychotropic drugs, with or without ethanol, is an important problem in the field of forensic toxicology (1,2). Paroxetine, a selective serotonin reuptake inhibitor, has a high affinity for serotonergic uptake sites. This drug increases the concentration of serotonin in the synaptic cleft by inhibiting its re-uptake (3,4). Flunitrazepam, an *N*-methyl-2´-fluoro analogue of nitrazepam (5,6), is a central nervous system depressant that may cause drowsiness, hangover, fatigue, dizziness and ataxia (5), and additive effects may occur when ethanol is co-ingested (6). Here we report a case of death with putrefactive changes involving the toxicity of paroxetine, flunitrazepam, and ethanol.

CASE REPORT

A Japanese male in his fifties was found dead in his room in the middle of summer. He had a history of alcohol dependence. Subsequent investigation by the authorities revealed that he had been receiving therapy for depression and alcohol problems, and was taking prescribed drugs.

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The deceased was 168 cm in height and 74.5 kg in weight. Putrefactive changes were evident. The heart weighed 389 g and contained 37 ml blood without coagulum. The brain weighed 1405 g and was discolored. The left and right lungs weighed 498 g and 484 g, respectively, and were congested. Approximately 20 ml of stomach contents, which included a red-brownish fluid, were noted. Other than congestion and putrefactive changes, no notable changes in other organs were observed. A drug screening test using a Triage™ (Biosite Diagnostic Inc., San Diego, CA, USA) panel was positive for benzodiazepines. Postmortem samples of the left/right heart blood, femoral venous blood, urine, and stomach contents were collected for toxicological examination and stored at -20°C until analysis.

Toxicological analysis

Toxicological analysis was performed using a 6890N gas chromatograph combined with a 5973 MS mass spectrometer (Agilent Technologies, Santa Clara, CA, USA). Identification and quantification of each drug were performed as described (7). Chromatographic separation was performed with a fused-silica capillary column DB-5MS (30 m × 0.25 mm I.D., 0.25 μm film thickness; J&W Scientific, Folsom, CA, USA). The operating conditions for gas chromatography mass spectrometry (GC/MS) were as follows. The carrier gas was helium in constant pressure mode. The injector temperature was set at 260 °C. The oven temperature was set at an initial temperature of 60 °C for 2 min, and was programmed to then rise 20 °C/min to 300 °C with maintenance at 300 °C for 10 min. The MS system was operated in the electron-impact mode with an electron energy of 70 eV