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CASE REPORT

Life-threatening intoxications related to persistent MDMA (3,4-methylenedioxymethamphetamine) concentrations

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KEYWORDS
3,4-methylenedioxy-methamphetamine;
Toxicity;
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Summary
Introduction. — After a loss of interest from drug users, the use of 3,4-methylenedioxy-methamphetamine (MDMA, ecstasy), an illicit phenethylamine, is currently highly prevalent, especially in young peoples, for its stimulant and euphoric effects.
Methods. — We report the cases of two young men who presented with life-threatening complications related to the occasional use of MDMA. The interest of these cases is related to persistent concentrations of MDMA.
Results. — The first patient aged from 21 presented an ischemic stroke after the recreational consumption of MDMA. MDMA and metabolite (MDA) plasma concentrations measured 5 days after the consumption were 10.2 ng/mL and 2.3 ng/mL, respectively. The patient recovered with the persistence of a significant facial paralysis. The second patient aged of 19 years presented a multiple organ failure shortly after the recreational consumption of MDMA. The patient's clinical and biological state required dialysis and liver transplantation. MDMA and MDA plasma

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concentrations measured 3 days after the consumption were 133 ng/mL and traces, respectively. The evolution was favorable after liver transplantation, with persistent chronic kidney disease stage 2.

Conclusion. — As shown in these two cases, plasma MDMA concentrations measured 3/5 days after the substance's consumption were particularly high suggesting whether a consumption of a large amount and/or a saturation of the hepatic/renal elimination mechanism. Therefore, since MDMA excretion from plasma can be delayed, complete toxicology screening including the measurement of MDMA concentrations should be considered in the presence of any suspicion of MDMA intoxication.

Introduction

3,4-methylenedioxymethamphetamine (MDMA, ecstasy), is a synthetic amphetamine, which enhances the release of dopamine, serotonin and norepinephrine [1]. After a loss of interest from users before the 2010s, the consumption of MDMA has become increasingly prevalent in Europe with increase MDMA production, availability and use, new online markets, alerts on both high-dose MDMA tablets and adulterated tablets, and evidence of low but potentially rising numbers of MDMA-related hospital admissions and even deaths in some countries [2].

The French Addictovigilance Network (FAN) via epidemiologic surveys as well as the poisoning centers reported the increase of MDMA-related complications [3,4]. Even if MDMA content in ecstasy tablets is very variable, data from French Monitoring Centre for Drugs (OFDT) on MDMA custom seizures (SINTES/INPS) showed that content of MDMA pills has increased: the average dose per tablet increased from 50 to 60 mg in the 2000s to 100—150 mg in 2012 with some reaching 200 mg. This trend is confirmed by the dramatic increase in MDMA related serious complications notified to the FAN form 25 in 2010 to 140 in 2013 (which respectively represent 1.0% and 4.2% of all French spontaneous notifications) [3].

Complications related to MDMA consumption are wide and patients' presentation may vary. Severe acute symptoms include serotonin syndrome, exertional hyperpyrexia leading to rhabdomyolysis and multi-organ failure, hyponatremia and cerebral oedema, isolated acute liver failure, cerebrovascular accidents, acute anxiety and panic disorder and sudden death [5]. We report the cases of two young men who presented with life-threatening complications related to the occasional use of MDMA. The interest of these cases is related to the delayed MDMA concentration.

Cases report

Case 1

A 21-year-old male was found at home on the ground in a state of agitation with tremors. The subject had a history of childhood epilepsy, social phobia and sleep disorders. He was particularly thin, with a Body Mass Index (BMI) of 15.7. The history of substance use includes active smoking (tobacco), a festive alcohol and recreational uses of cannabis, cocaine and MDMA on weekend. At the time of the medical management, the patient confirmed the intake of three ecstasy tablets with alcohol five days before. At the emergency department (ED), patient's condition first worsened. He presented hemiplegia, Glasgow Coma Scale (GCS) at 11/15, National Institute of Health Stroke Score (NIHSS) at 23/42, tachycardia (119 bpm), blood pressure at 148/90 mmHg and oxygen saturation at 93%. Temperature (36.2 °C), and glucose level (1.42 g/L) were normal. An ischemic stroke of the right middle cerebral artery was diagnosed after a cerebral magnetic resonance imaging (MRI), which showed an extensive infarction without hemorrhagic modification, with occlusion of the right M1-M2 junction. Biological analysis did not show renal or liver failure. Toxicological blood screening was positive for MDMA and MDA (3,4-methylenedioxyamphetamine, an active metabolite of MDMA). Values are summarized in the Table 1. The initial medical management was performed by thrombectomy. The patient was hospitalized in intensive care unit with intubation. After 9 days, he recovered with the persistence of a significant facial paralysis.

Case 2

This case concerns a 19 year-old male with a medical history of occasional consumption of tobacco and cannabis. His BMI was 18.3. He was found at a rave party with profuse sweating, tetany crisis and impairment in consciousness. Patient's friends reported the consumption of ecstasy (no amount reported), cannabis and alcohol (2 beers). Because of a severe hypertension (200 mmHg) and tachycardia (200 beats/minute), the patient was transferred to the ED. At the ED, consciousness disorders worsened (GCS at 5/15, non-reactive bilateral mydriasis). After intubation, the patient was placed on mechanical ventilation and transferred into intensive care unit. He presented hyperthermia (41.1 °C), hypotension (90/60 mmHg) and tachycardia (150 bpm). Abnormal blood biological values were hypernatremia (147 mmol/L; Normal: 135—145 mmol/L), creatine

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