Accidental ingestion of ‘Ecstasy’ (3,4-methylenedioxymethylamphetamine)

A R Bedford Russell, R H Schwartz, S Dawling

Abstract
There is no report of the effects of ‘Ecstasy’ (3,4-methylenedioxymethylamphetamine) poisoning in childhood. The case of a 13 month old boy who ingested one capsule of Ecstasy is reported. Neurological and cardiovascular side effects predominated, which responded well to treatment with a clromethiazole infusion.

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Recreational use of ‘Ecstasy’ or ‘E’ is common particularly within the confines of acid house parties. Chemically Ecstasy is 3,4-methylenedioxymethylamphetamine (MDMA). MDMA is a psychoactive phenylisopropylamine, chemically related to both amphetamine-like stimulants and hallucinogens such as mescaline, and is reputedly safe. The usual dosage is 50–150 mg, and the duration of action is 4–6 hours. The drug reportedly induces a state of enhanced self awareness and ability to communicate, without disturbing normal thought processes. Increasing use by young people has been documented, but our report and those of fatal or serious side effects in teenagers and adults5 must caution against the belief that this drug is safe.

Case report
A 13 month old boy was admitted with a history of ingesting a capsule of Ecstasy found on the floor 30 minutes previously. He was in the care of his grandmother at her home while his mother was at work. His uncle, who was present, freely admitted to recreational use of the drug in this home where he also lived, but not on the evening in question.

The clinical features are summarised in table 1. The convulsion was unresponsive for 60 minutes to a total of 2·5 mg/kg diazepam and 0·4 mg/kg of haloperidol, both given intravenously. A clromethiazole infusion (10 mg/kg/hour) was commenced and there was a dramatic response with both the convulsion and the cardiovascular instability resolving within 5–10 minutes. A further self limiting episode of hypertension (180/70 mm Hg) and tachyarrhythmia (170 beats/min) occurred five hours after admission. All abnormal signs had resolved by seven hours so the clromethiazole infusion rate was halved and finally stopped at 16 hours.

No haematological or biochemical abnormalities were observed. Results of toxicology are shown in table 2.

The possibility of non-accidental ingestion of...
MDMA was a foremost consideration and social services staff were therefore involved at an early stage. Prompt presentation in the early evening and a clear, consistent history from carers who themselves had no signs of MDMA ingestion resulted in the conclusion that the episode was accidental.

The child recovered completely and was discharged four days after admission to the care of his mother, with social service follow up and strong advice regarding the safety of drugs in the home. He had no short term neurological deficit but was subsequently lost to medical follow up.

Discussion
Animal studies show that MDMA reduces 5-hydroxytryptamine and 5-hydroxy indoleacetic acid concentrations at nerve terminals, and the metabolite 3,4-methylenedioxyamphetamine (MDA) selectively destroys 5-hydroxytryptamine nerve terminals. MDMA also increases dopamine turnover, this being implicated in the long term neurotoxicity of MDMA use. The dopamine receptor antagonist haloperidol and some 5-hydroxytryptamine antagonists are effective in blocking these actions, hence the recommendation of haloperidol in the treatment of side effects.

Four fatalities in adults related to Ecstasy abuse have been reported, with recorded MDMA concentrations between 0·2 mg/l and 1·1 mg/l; one patient survived with a concentration of 7·0 mg/l. Fatalities have been associated with cardiovascular autonomic derangement and in one case coagulopathy and hyperthermia. The exact cause of the latter complications is unknown, but MDMA induced 'oxidative stress' may play a part. Alternatively coagulopathy and hyperthermia may be linked to the circumstances of the ingestion, be idiosyncratic reactions, or the result of unidentified impurities in the manufacturing process.

In addition, the effects of amphetamine induced hyperthermia are similar to the effects of heatstroke and include derangements in coagulation. Rapid control of the rising temperature in our case may have prevented coagulopathy occurring by a similar mechanism.

Controlling the seizure proved the major problem in this child. Chlormethiazole infusion brought about rapid control not only of the convolution, but also of tachyarrhythmia and hypertension. Chlormethiazole may have acted by potentiating the effects of the inhibitory neurotransmitters γ-aminobutyric acid and glycine. Serotonergic mechanisms and dopamine inhibition are possibly secondary.

In conclusion Ecstasy is not a 'safe' drug. It is a drug of abuse and must at least be stored safely away from children. We suggest that chlormethiazole may have a role in controlling toxicity from MDMA.

5 Brown C, Osterhö J. Multiple severe complications from recreational ingestion of MDMA (Ecstasy). *JAMA* 1987; 258:780-1.
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