

# High incidence of mild hyponatraemia in females using ecstasy at a rave party

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## **Abstract**

Background Globally, millions of subjects regularly use ecstasy, a drug popular due to its empathogenic and entactogenic effects. Dilutional hyponatraemia, mainly caused by direct stimulation of antidiuretic hormone (ADH) secretion by ecstasy, is among the many side effects of the drug (active substance 3, 4-methylenedioxymethamphetamine, MDMA). Severe, symptomatic hyponatraemia related to the use of MDMA has been reported in more than 30 cases. The mortality of this complication is high and mainly females are involved. Dramatic cases that reach the literature probably represent the tip of the iceberg. We decided to study the incidence of hyponatraemia in subjects using MDMA at an indoor rave party.

Methods The study was performed at the indoor event Awakenings, held in Amsterdam in the fall of 2010. The plasma sodium concentration was measured at the party using a point of care method in 63 subjects using MDMA and 44 controls. The use of MDMA was confirmed by a urine test.

Results The plasma sodium concentration in subjects using MDMA was significantly lower than in those not using the drug ( $138 \pm 2$  mmol/L versus  $140 \pm 2$  mmol/L, respectively,  $P < 0.001$ ). The overall incidence of hyponatraemia, defined as a plasma sodium concentration  $< 136$  mmol/L, was 14.3% in MDMA users (9/63 subjects). Most cases of hyponatraemia

occurred in females, in whom the incidence was 26.7% (8 of 30 females), with lowest values of 133 mmol/L. The number of ecstasy pills ingested by the females developing hyponatraemia was not different from that ingested by those who did not develop this complication. Fluid intake in ecstasy users exceeded that of non-users, suggesting a dipsogenic effect of the drug. <br/>Conclusions Only 3% of males, but no less than 25% of females attending a rave party and using MDMA developed mild hyponatraemia during the event. Especially females are therefore probably also at risk of developing severe symptomatic hyponatraemia. Not using MDMA is obviously the best option to prevent MDMA-induced hyponatraemia. However, accepting the fact that millions use the drug every weekend, strategies should also be developed to prevent hyponatraemia in subjects choosing to take MDMA. This would include matching the electrolyte content of the fluids and food ingested to that of the fluids that are lost during the use of MDMA, mainly by perspiration. Users of MDMA and emergency health care workers should become more aware of the relatively high incidence of MDMA-induced hyponatraemia and of potential strategies to prevent this complication.

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