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LETTER TO THE EDITORS

Acute amnestic syndrome due to MDMA exposure

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Dear Sirs,

We report on a 21-year-old man who developed sudden memory loss after intake of two pills of ecstasy. He was not able to remember any incident within the first 2 days after ecstasy exposure. It was reported that he repetitively asked the same questions during this time, and that he was not able to transfer information into memory at all. Before this incidence, he consumed one pill of MDMA once or twice a month for a total of 4 months. For the same period of time, he consumed one joint of marijuana at 2-week intervals.

Detailed neuropsychological assessment (Verbal Learning and Memory Test, Wechsler Memory Scale (WMS), Benton Test, Rey Complex Figure Test) 3 weeks later revealed severe short-term memory impairment particularly for verbal material including word lists and semantic contents. Visuo-constructive abilities, however, were unremarkable upon short-term recall. Furthermore, there was no evidence for an impairment of neither procedural memory nor other higher cortical functions. Four months later, i.e. 5 months after exposure, the patient persistently presented with a severe retro and anterograde amnesia. There was only marginal improvement of short-term memory span in learning word lists. He reported that keywords would help him to access memory contents which could be confirmed by means of the WMS. Despite his severe memory problems that strongly impact on his daily life, he is able to pursue his professional training as specialist for warehouse logistics. As an additional change, he reported an unintentional weight gain of 15 kg due to an increased food intake. Sleep habits were unchanged.

The initial and 3-week follow-up MRI scans showed persistent bilateral T2 and DWI hyperintense signals of the hippocampus formations without contrast enhancement (Fig. 1). Upon MR spectroscopy, the NAA/Cho ratio of the hippocampus was decreased. Viral (HSV) and limbic encephalitis was ruled out including negative tests for antibodies against Hu, Yo, Ri, Ma-2, CV2-CRMP, NMDA receptors, LGI1, CASPR2, AMPA, and GABA-B. The blood chemistry showed unremarkable findings for cell blood count, electrolytes, liver and renal function tests, and infectiological parameters (negative serology for treponema pallidum, borrelia burgdorferi). CSF analysis was unremarkable including absence of intrathecal immunoglobulin synthesis, oligoclonal bands and HSV1/2-DNA. At the latest MRI follow-up, there was no evidence of hippocampal sclerosis. The EEG revealed alpha rhythm with intermittent bilateral temporal slowing and no epileptic discharges.

The recreational drug ecstasy (3,4-methylenedioxymethamphetamine (MDMA)) may give rise to chronic [2, 3] or—as in this case—acute pure amnestic syndromes [7]. Other toxic reactions of MDMA include acute leukoencephalopathy of midbrain, basal ganglia and insulae [4, 7]. Acute reactions to MDMA may mimic transient global amnesia (TGA) as in this case except for the time course which is clearly different from TGA [7]. In keeping with the patient reported by Spatt et al., retro- and anterograde amnesia was persistent several months after

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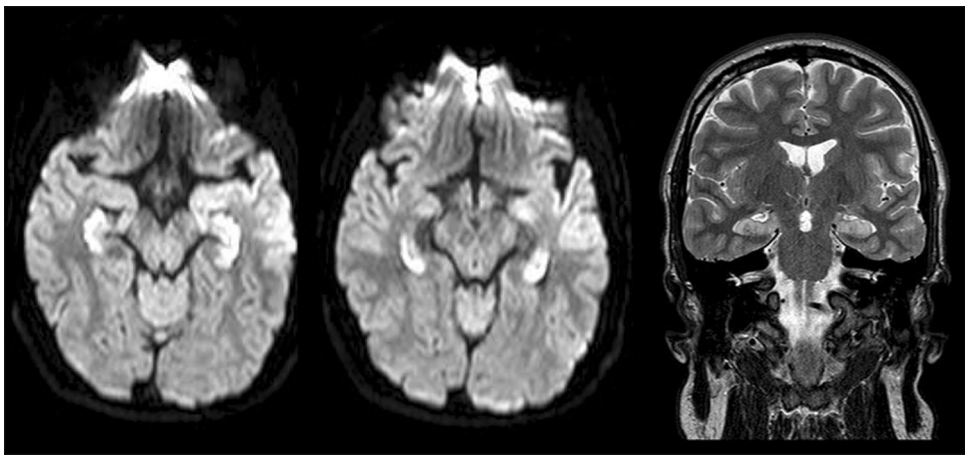

Fig. 1 Brain MRI scans (here: 3 weeks after exposure) revealed hyperintense signals of the hippocampus upon DWI and T2 sequences (image on the *right* side)

MDMA ingestion [7]. The clinical presentation of these two patients is reminiscent of patient H.M., who developed acute anterograde amnesia caused by bilateral medial temporal lobe resection to improve intractable epilepsy [1].

MDMA-induced toxicity at recreational doses may be mediated by serotonergic and dopaminergic mechanisms [5, 6]. It is debatable whether the acute damage of the hippocampus formation is mediated by (1) direct MDMA neurotoxicity, (2) severe dehydration and overheating due to strong sweating and reduced desire to drink, or (3) both in combination.

Compliance with ethical standards

Conflicts of interest The authors report no conflict of interest.

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Ethical standards The study protocol including MRI was approved by the local ethics committee at the University of Lübeck.

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