Bilateral Sixth Nerve Palsy Associated With MDMA ("Ecstasy") Abuse

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PURPOSE: To report the association of methylenedioxymetamphetamine (MDMA, "ecstasy") abuse and bilateral sixth nerve palsy.

METHODS: Case report.

RESULTS: A 17-year-old male presented with horizontal diplopia in all directions of gaze after having taken MDMA tablets at 5-day to 7-day intervals during a 2-month period. Examination showed bilateral sixth nerve palsy. Ocular motility returned to normal within 5 days without use of MDMA and with no other treatment.

CONCLUSION: Methylenedioxymetamphetamine "ecstasy" abuse should be considered in the differential diagnosis in otherwise unexplained sixth nerve palsy. (Am J Ophthalmol 2000;129:408–409. © 2000 by Elsevier Science Inc. All rights reserved.)

THE USE OF THE RECREATIONAL DRUG 3,4-METHYLenedioxymetamphetamine (MDMA, "ecstasy") resembles hallucinogenic and amphetamine effects and has been associated with a variety of serious adverse reactions, such as confusion, anxiety, flashbacks, depression, hyperthermia, cerebral edema, hepatopathy, and psychotic behavior.[1–4] Also, infrequently, dilated pupils and nystagmus have been reported as neuro-ophthalmological symptoms.[1]

We report a patient in whom bilateral sixth nerve palsy developed after MDMA abuse. The 17-year-old male was referred with double vision. Besides ocular symptoms, minimal paresthesia in both arms and legs and mild sleepiness were present. Horizontal diplopia was perceived in all directions of gaze, with the two images being closer together at near than at far fixation. Measurement of binocular alignment showed esotropia of 10 prism diopters in primary, 15 prism diopters in right, and 15 prism diopters in left gaze (Figure 1). Abduction was mildly limited in both eyes. Thus, diagnosis of bilateral sixth nerve palsy was made. Examination of the pupils, the optokinetic and vestibulo-ocular reflex, visual acuity, visual fields, slit lamp, and fundus examination of a dilated pupil revealed no abnormalities in both eyes.

After admitting the patient for further observation and examination of sixth nerve palsy, he reported MDMA abuse of 2 months' duration, allowing 5-day to 7-day intervals between each MDMA intake. He always took one or two tablets, each of which typically contains 80–160 mg of the drug. Approximately 24 hours before onset of symptoms, he had taken two tablets of MDMA.

Neurological examination, cranial magnetic resonance imaging (MRI), cranial MRI angiography, examination of spinal fluid, serology, electroencephalography, and visual-evoked potentials were all normal. No signs of inflammatory central nervous system disease, chronic poisoning, or neurodegenerative disease were noted. Ocular motility as

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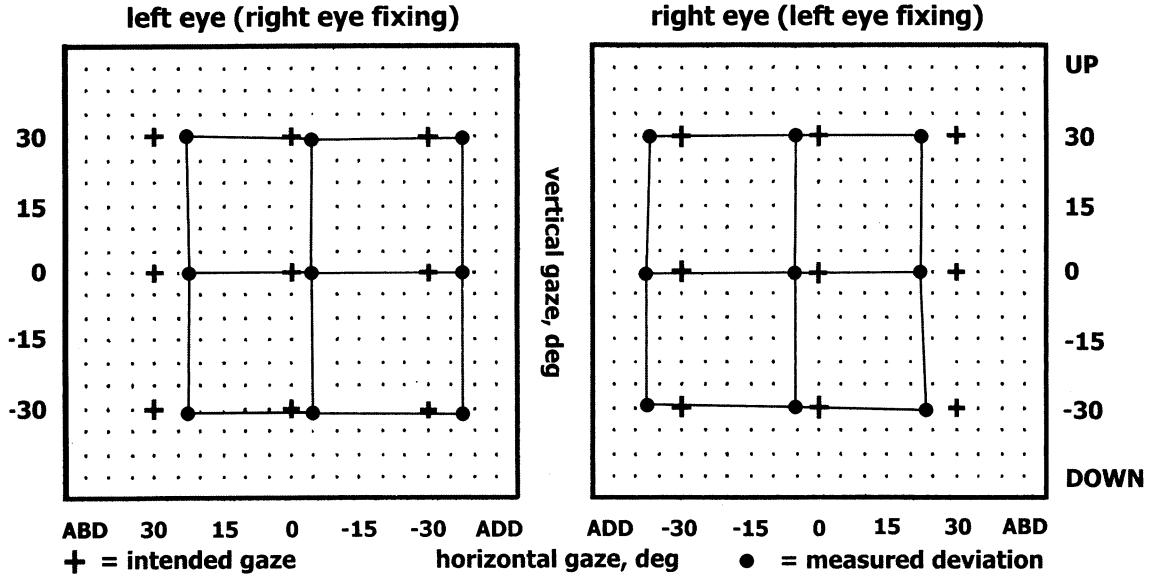

FIGURE 1. Hess screen chart shows ocular alignment in different directions of gaze. Esotropia increases in both left and right gaze, which is typical in bilateral sixth nerve palsy.

well as sleepiness and paresthesia gradually recovered to normal within 5 days without use of MDMA and with no other treatment.

In the absence of any other reasons, we assume MDMA abuse is the likely cause of sixth nerve palsy in our patient. This palsy may result from an interaction of MDMA with serotonin metabolism involved in sixth nerve function. Serotoninergic interneuronal fibers have been reported in the abducens nerve of the cat[5] and might be present in humans as well. Conversely, a cerebral edema[4] not detectable by MRI could be considered as another possible cause of transient sixth nerve palsy.

In otherwise unexplained sixth nerve palsy, MDMA abuse should be considered in the differential diagnosis.

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