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CASE REPORT

3,4-Methylenedioxymethamphetamine (MDMA) -Induced Macular Haemorrhage: a Case Report

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Abstract

A case of 28-year-old female patient with retinal haemorrhage after taking 3,4-methylenedioxymethamphetamine (ecstasy, MDMA) and having a sexual intercourse is described. Ecstasy is a drug that is often consumed by young people. It leaves various consequences on the human body. Retinal haemorrhage in the eye caused by ecstasy has been described before. Like in this case, the experience in spontaneous resolving of the MDMA-induced retinal haemorrhage is favourable.

Key words: Illicit drugs; 3,4-methylenedioxymethamphetamine; Retinal haemorrhage.

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Introduction

3,4-Methylenedioxymethamphetamine (MDMA), named also ecstasy or molly is a psychoactive synthetic drug, most commonly taken by young people for recreational purposes.[1] MDMA achieves its effects by releasing the neurotransmitters serotonin, dopamine and noradrenaline in the brain. It leads to an increase in energy, amplify sensory perception, pleasure and also empathy.[2] It is usually taken orally, as a tablet or a capsule. The first effects are felt after about 30 minutes and can last for several hours.[3] MDMA users encounter side effects of this drug such as addiction, sweating, palpitations, sleep and memory problems, paranoia, blurred vision.

Case History

A 28-year-old white female patient was referred to the hospital after a sudden decrease in vision on her left eye that happened ten days ago and which was preceded by a strong headache. After taking a thorough patient's medical history, the patient admitted that she had taken ecstasy and was sexually active after that. The patient was a recreational drug user. On examination her uncorrected visual acuity (UCVA) on the right eye was 1.0 (Snellen), and on the left 0.5 (Snellen) without a possibility for additional spectacle correction. Intraocular pressure was normal (13 mmHg on the right eye, and 12 mmHg on the left eye). Slit-lamp exam had shown no afferent pupillary

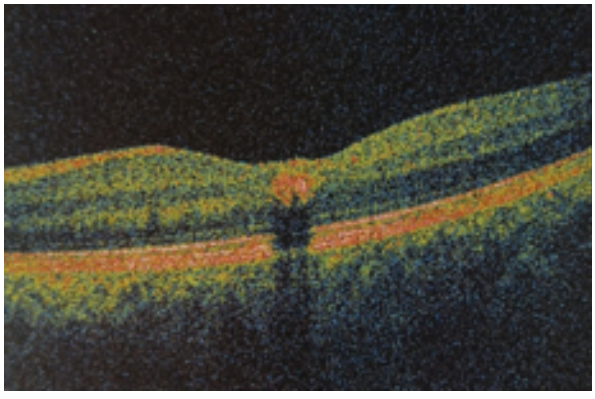

Figure 1: Optical coherence tomography (OCT) of a 28-year-old female patient with 3,4-methylenediohymethamphetamine (MDMA)-induced foveal retinal haemorrhage. OCT taken on 27 March 2020.

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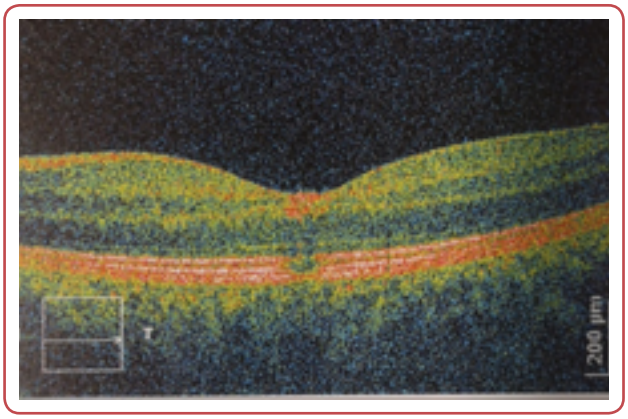

Figure 2: Optical coherence tomography (OCT) of a 28-year-old female patient with 3,4-methylenediohymethamphetamine (MDMA)-induced foveal retinal haemorrhage. OCT taken on 1 April 2020.

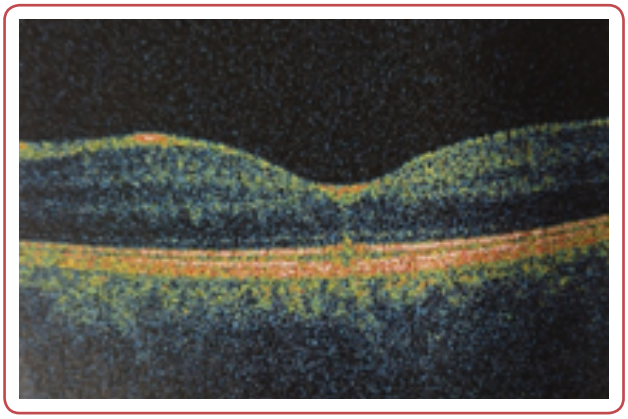

Figure 3: Optical coherence tomography (OCT) of a 28-year-old female patient with 3,4-methylenediohymethamphetamine (MDMA)-induced foveal retinal haemorrhage. OCT taken on 11 April 2020.

defect, nor any other pathological findings in the anterior segment. Furthermore, fundus exam of the right eye was normal and without any pathological findings, while intraretinal haemorrhage was found in the left fovea. The finding was then confirmed by the optical coherence tomography (OCT) of the left eye (Figure 1). As a precaution, the patient was referred for a detailed cardiological and neurological exams, which both turned out normal (blood pressure 110/70 mmHg, heart rate 65 beats/min, no neurological illnesses). No local or systemic ophthalmological therapy was prescribed.

Four days after the initial exam, the patient returned for a regular check-up. Subjectively, her left-eye vision was better. On examination, the right eye retained previous UCVA, while the left eye improved to 0.8 (Snellen) of the UCVA. Fundus exam showed the regression of the haemorrhage, which was also confirmed with the OCT (Figure 2). The improvement in vision was also noticed ten days later when the patient came for the final check-up. The fundus exam showed clear fovea, and the same findings were seen on the OCT (Figure 3). The left eye UCVA was 0.9 (Snellen).

Discussion

In this case report, a female patient with macular haemorrhage after taking ecstasy that led to vision blurring and loss of visual acuity (VA) was presented. Physical strain, increased blood pressure and heart rate could have been additional contributing factors. It would be good if MDMA could have been identified in blood or urine, but the time of elimination of MDMA from the body is about 3-5 days. The patient came to the clinic 10 days after loss of visual acuity. Urinary recovery of MDMA and metabolites over 5 days ranged between 24 % and 52 % of the MDMA dose. Of the total MDMA recovered in urine, 46 % and 36 % were excreted between 0–24 h after the low and high doses, respectively.[4] After 30 minutes, the concentration of MDMA in the blood stream begins to rise[5] and 1, 5 and 3 hours after consumption it reaches its maximum values in the blood.[6] In the next few hours the peak concentrations of MDMA and its metabolites are halved due to their metabolism and excretion.[7] It is possible that Valsalva's phenomenon caused by the sexual intercourse contributed to the bleeding or that the use of MDMA facilitates the mechanism of Valsalva bleeding. In humans who are using low doses of MDMA there are some adverse changes in brain microvasculature.[8–9] Large preretinal haemorrhages can be caused by Valsalva retinopathy.[10] It is not completely clear what is the mechanism of retinal bleeding and vision blurring.[11] Some studies suggest that it may be due to increased blood pressure and heart rate.[11–13] Blood dyscrasias were excluded by laboratory findings.

Ecstasy-induced macular haemorrhage was first described in 1998.[14] Although it is the authors' opinion that bleeding can occur in any part of the retina, macular, foveolar haemorrhage is noticed immediately because blurred vision occurs and such persons seek medical attention. Other drugs, methamphetamine, alcohol, cocaine, marijuana and antiepileptic drugs can induce vascular occlusion and retinal haemorrhage.[15–17] Like in this case, these other reports have also reported spontaneous resorption of macular haemorrhage after a certain period, without permanent consequences.

Drug abusers can sometimes have ocular complications because those substances cause transient increase in blood pressure and can cause a Valsalva retinopathy.[16] Ecstasy can cause ventricular fibrillation, hypertension, hyperpyrexia, tachycardia and intracerebral haemorrhage.[18-20]

If this case is analysed, the cause of retinal haemorrhage could be nothing but the rise in blood pressure. The cause of retinal haemorrhage is the same as the cause of intracerebral haemorrhage.[20] Cocaine and methamphetamine taken nasally can also cause retinal haemorrhage,[21] because they have direct effect on autonomous and vasoactive nerves in choroid but indirect in the retina.[16] This makes the retinal blood vessels susceptible to changes in elevated blood pressure and is a possible mechanism for the occurrence of haemorrhage in this patient. Therefore, ecstasy can be seen as an indirect factor of retinal haemorrhage.

Conclusion

In conclusion, it could be said that this case shows not only the effects that MDMA can have on the retinal pathology, but also that the best treatment of these diseases in many cases is no treatment at all.

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None.

Conflict of interest

None.

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