

One Night of Fun, One Lifetime of Effects: MDMA and Sympathomimetic Syndrome

Mustafa Tolga ÖZDAL¹, Melih YÜKSEL¹, Mehmet Oğuzhan AY¹, Yeşim İŞLER¹, Umut OCAK¹, Zülfi ENGİNDENİZ¹, Halil KAYA

¹Department of Emergency Medicine, University of Health Sciences, Bursa Yuksek Ihtisas Training and Research Hospital, Bursa, Türkiye

Abstract

Sympathomimetic syndromes are rare medical conditions involving complex clinical pictures caused by substances that have a stimulatory effect on the sympathetic nervous system or have similar effects to the sympathetic nervous system. In this case report, the clinical manifestations of sympathomimetic syndromes, the diagnostic process, treatment strategies and the difficulties encountered especially in emergency medicine will be reviewed.

Keywords: Critical care, Emergency department, Sympathomimetic syndrome

Introduction

Sympathomimetic syndromes are rare medical conditions involving complex clinical pictures caused by substances that have a stimulatory effect on the sympathetic nervous system or have similar effects to the sympathetic nervous system¹⁻⁴. These syndromes are caused by the use of substances that enhance or mimic the effects of the sympathetic nervous system by binding to adrenergic receptors in the body¹⁻³. Sympathomimetics can trigger a range of symptoms and signs with serious effects on respiration, circulation and the central nervous system^{1-3,5}.

Sympathomimetic syndromes include rare and complex clinical conditions that can often be difficult to understand¹⁻⁵. These conditions can arise from a variety of causes including drug abuse, suicide attempts, chemical exposure or toxic interactions^{5,6}.

In this case report, the clinical manifestations of sympathomimetic syndromes, the diagnostic process, treatment strategies and the difficulties encountered especially in emergency medicine will be reviewed.

Case Report

The patient, a 31-year-old male, known to be in good general health, presented to the emergency department after using a synthetic drug called ecstasy (3,4-metilenedioksi-N-metilamfetamin [MDMA]) by his friends. The patient was brought to the emergency room by his relatives after rapidly increasing anxiety, agitation, high fever and sweating after ecstasy use. On physical examination, the patient's consciousness was alert and oriented, but a rapid pulse and high blood pressure were detected. The vital signs of the patient at the time of arrival to the emergency room were Blood Pressure Arterial: 160/95 mmHg, Pulse rate: 130 beats/minute, Respiratory Rate: 22/minute, Oxygen Saturation measured by pulse oximeter: 99% and the patient's temperature was 38,4 degrees Celsius. Eye examination revealed mydriasis, bilateral direct and indirect light reflexes were normal. Agitated behavior and excessive muscle movements were also noted. Respiratory rate and depth of respiration increased. Liver function tests, renal function tests and complete blood count were within normal limits. There was no acidosis in blood gas.

Corresponding Author: Mustafa Tolga ÖZDAL **e-mail:** mtolgaozdal@gmail.com

Received: 05.12.2023 • **Revision:** 19.03.20243 • **Accepted:** 01.04.2024

Cite this article as: Ozdal MT, Yuksel M, Ay MO, Isler Y, Ocak U, Engindeniz Z Kaya H. One Night of Fun, One Lifetime of Effects: MDMA and Sympathomimetic Syndrome. Eurasian J Tox. 2024;6(1): 15-16

It was evaluated that the patient developed sympathomimetic syndrome related to the ecstasy (MDMA) he had used.

The patient was given 20 mg diazepam and 150 cc saline per hour. The patient was followed up in the emergency department for approximately 16 hours. His complaints regressed. The patient was consulted to Psychiatry and discharged with recommendations.

Discussion

Sympathomimetics are substances that have a stimulant effect on the sympathetic nervous system and can cause symptoms such as increased heart rate, elevated blood pressure and extreme agitation^{1,2,3}. The observed symptoms and physical examination findings point to this diagnosis.

The patient requires urgent medical intervention and stabilization of vital signs should be aimed first⁵. The patient's pulse rate, blood pressure and respiratory rate should be closely monitored and supportive treatment should be given when necessary⁴.

There is no specific antidote for MDMA intoxication or a treatment protocol that provides the opposite effects^{2,7}. Therefore, treatment management is based on symptom-oriented supportive therapies. Sedative drugs and methods to reduce agitation should be preferred to control the patient's agitation and excessive muscle movements.

If necessary, the patient may need to be transferred to an intensive care unit depending on the clinical condition and severity of symptoms. However, obtaining detailed information about the substance the patient is using and the process of use will help to determine the best possible treatment strategy.

In this case report, a patient admitted to the hospital due to MDMA use, which can cause sympathomimetic syndromes, is analyzed. It was emphasized that sympathomimetics can lead to serious clinical findings by stimulating the sympathetic nervous system¹⁻³.

MDMA is a synthetic drug used for recreational purposes that is thought to increase emotional bonding^{1-3,7}. However, overdose and abuse can lead to the formation of sympathomimetic syndromes and life-threatening clinical pictures. Therefore, the importance of raising drug

awareness in the society, awareness-raising studies on drug abuse and preventive measures should be emphasized.

Conclusion

This case underscores the critical importance of recognizing and managing sympathomimetic syndromes, particularly those induced by substances like MDMA. The presented patient's clinical course highlights the significance of prompt medical intervention, vital sign stabilization, and symptom-oriented supportive therapies. In emergency settings, healthcare providers should prioritize detailed substance use history, enabling tailored treatment strategies. The lack of a specific antidote for MDMA reinforces the need for a vigilant and multidisciplinary approach. Beyond individual cases, this report emphasizes the broader societal necessity for increased drug awareness, educational initiatives on substance abuse, and proactive preventive measures.

References

1. Kalant H. The pharmacology and toxicology of "ecstasy" (MDMA) and related drugs. *CMAJ*. 2001 Oct 2;165(7):917-28. PMID: 11599334; PMCID: PMC81503.
2. Steinkellner T, Freissmuth M, Sitte HH, Montgomery T. The ugly side of amphetamines: short- and long-term toxicity of 3,4-methylenedioxymethamphetamine (MDMA, 'Ecstasy'), methamphetamine and D-amphetamine. *Biol Chem*. 2011 Jan;392(1-2):103-15. doi: 10.1515/BC.2011.016. PMID: 21194370; PMCID: PMC4497800.
3. Jansen KL, Theron L. Ecstasy (MDMA), methamphetamine, and date rape (drug-facilitated sexual assault): a consideration of the issues. *J Psychoactive Drugs*. 2006 Mar;38(1):1-12. doi: 10.1080/02791072.2006.10399822. PMID: 16681170.
4. King A, Dimovska M, Bisoski L. Sympathomimetic Toxidromes and Other Pharmacological Causes of Acute Hypertension. *Curr Hypertens Rep*. 2018 Feb 24;20(1):8. doi: 10.1007/s11906-018-0807-9. PMID: 29478133.
5. Chan TC, Evans SD, Clark RF. Drug-induced hyperthermia. *Crit Care Clin*. 1997 Oct;13(4):785-808. doi: 10.1016/s0749-0704(05)70369-9. PMID: 9330841.
6. Brown H, Pollard KA. Drugs of Abuse: Sympathomimetics. *Crit Care Clin*. 2021 Jul;37(3):487-499. doi: 10.1016/j.ccc.2021.03.002. PMID: 34053702.
7. Shannon M. Methylenedioxymethamphetamine (MDMA, "Ecstasy"). *Pediatr Emerg Care*. 2000 Oct;16(5):377-80. doi: 10.1097/00006565-200010000-00022. PMID: 11063374.