OLGU SUNUMU **CASE REPORT**

BRAIN STEM INFARCTION DUE TO BASILAR ARTERY OCCLUSION AS A COMPLICATION OF SYMPATHOMIMETIC DRUGS CONTAINING MDMA

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ABSTRACT

MDMA (3,4 methylendioxymetamphetamine), or ecstasy, is an illicit sympathomimetic drug used for recreational purposes especially by young adults. It has been reported to cause stroke. The physiopathologic mechanisms underlying stroke is not clear but affects over sympathomimetic activity and serotonin transmission has been suggested. A young male patient was seen in emergency room with hemiparesis and dysarthria. Cerebral MRI disclosed brain stem infarction, cerebral MR angiography showed basillary artery thrombosis. No other etiologic factor was found. We wanted to present our case to emphasis the importance of drug abuse in young stroke patients.

MDMA İÇEREN SEMPATOMIMETIK İLAÇ KULLANIMI SONRASI GELİŞEN BASİLER ARTER TROMBOZUNA BAĞLI BEYİN SAPI ENFARKTI

"Ecstasy" olarak adlandırılan MDMA (3,4 methylendioxymetamphetamine) gençlerin ve genç erişkinlerin tek başına ya da başka maddelerle birlikte öforik ve enerji verici özellikleri nedeniyle kullandıkları sempatomimetik etkili bir maddedir. Sempatik sistem ve ayrıca serotonin aşırımı üzerindeki etkileri nedeniyle serebral vasküler olaylara yol açabileceği bildirilmiştir. Acil servise konuşma bozukluğu ve sağ yan güçsüzlüğü ile başvuran erkek hastanın serebral MRG tetkikinde beyin sapı enfarktı, MRA tetkikinde baziler arter trombozu saptanmıştır. Öykü derinleştirildiğinde MDMA kullanımını takiben yakınmaların geliştiği öğrenilmiştir. Sağ hemiparezi ve dizartrisi olan hasta iskemik serebrovasküler hastalık tedavisi almıştır. Etiyolojik başka etken saptanamayan olgumuzu özellikle acil serviste karşılaşılan genç inme olgularında madde kullanımının etiyolojide yer alabileceği gerçeğini vurgulamak için sunmak istedik.

INTRODUCTION

MDMA, (3,4 methylendioxymetamphetamine), or ecstasy, is an illicit drug used for irecreational purposes and was initially introduced in 1912 as an appetite suppressant. In the 1950s, it was used as a drug which could lessen inhibitions in patients undergoing psychoanalysis. In the mid-1980s, it became popular as a recreational drug primarily used by young adults (1). MDMA has ceased to be used medicinally now and is an established part of the illegal drug scene (2). No (LD50) studies in humans have been made. In patients with toxic MDMA abuse, LD50 approaches or, in some cases, exceeds the primate LD50 dose which is 22 mg/g2. MDMA is reported to cause many systemic disturbances including hyperthermia, increased blood pressure, hepatic and renal failure as well as cerebrovascular accidents (1, 3, 4, 5). In addition to sympathomimetic effects it is known that MDMA alters brain serotonin (5-HT) concentrations and that brain postsynaptic 5-HT2 receptors play a role in the regulation of brain microvasculature (6). MDMA users therefore be at risk for cerebrovascular accidents resulting from alterations in the systemic and cerebral methabolism. In case of cerebrovascular accidents in young adults and teenagers like our patient substance abuse should be kept in mind.

CASE

A 23 year old male patient arrived at an emergency room with right-sided weakness and numbness, inability to use his lower extremities to walk, and slurred speech. The patient reported abuse of "ecstasy" (MDMA: 3,4 methylendioxy metamphetamine) the previous night after not taking the drug for the previous 18 months. The patient's personal history also included cannabis and cigarette smoking. One year ago, the patient underwent angiography due to arterial obstruction of the left leg. Neurologic examination showed moderate right hemiparesis, right hemihypoalgesia, dysarhtria, and extensor plantar response on right side. Otherwise, no other abnormalities were noted during the physical examination. A cranial computed cranial tomography scan upon

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admission to the emergency room showed no abnormalities. Subsequent magnetic resonance (MR) imaging revealed an ischemic infarct in the brainstem (Figure 1-a, b, c) and cerebral MR angiography disclosed basilar artery occlusion (Figure 2). Treatment included antiagregant agents and rehabilitation. He made a partial recovery. No pathologic findings were found after an extensive search for the etiological factors of stroke. Available data imply strong association between MDMA abuse and cerebral infarction. The researchers concluded that MDMA use was responsible for the occurence of ischemic stroke. Cannabis was not considered as cause of ischeamic stroke since the patient did not smoke for the past 18 months. The patient volonteereed to give information about MDMA abuse and considered to be sincere about the concern of illicit drug use. Urine screen for cannabis metabolites was not performed.

Figure 1- MR images of brain stem infarction.

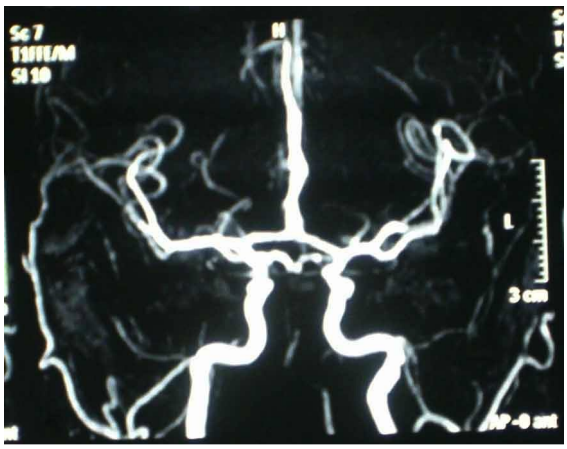

Figure 2. MR angiography showing basilar artery occlusion.

DISCUSSION

Toxic effets of MDMA abuse include malignant hyperthermia, acute hepatic and renal failure, acute respiratory failure, cardiovascular collapse, cardiac arrythmias, hypertension, rhabdomyolysis, disseminated intravascular coagulation, hyponatremia, inappropriate secretion of antidiuretic hormone syndrome, psychosis, and depression (1). Abuse of MDMA also may be complicated by intracerebral, subdural or subarachnoidal haemorrhage, ischeamic stroke, and probable impairment of cognitive functions (3,4,5). Drug related intracranial haemorrhages usually associated with high blood pressure but some research points out the relationship between intracranial haemorrhage and underlying vascular malformation (3,7). The physiopathologic mechanisms resulting from MDMA related stroke are unclear and probably multifactorial. Certain brain infarcts may result from arterial vasospasm and secondary intravascular thrombosis. Preliminary findings based on the study of brain cortical 5-HT(2A) receptor densities using [^{123}I]R91150 SPECT indicated that MDMA users might be at risk of cerebrovascular accidents resulting from impaired 5-HT neurotransmission, which plays a role in the regulation of brain microvasculature (7). Still little information is available regarding acute management or treatment of toxic ingestions (1). In the case of a cocaine and "ecstasy" abuser, acute basilar artery occlusion was treated by thromboaspiration with a favorable recovery (5). In young people, the search for the etiology of cerebrovascular accidents is very extensive and should include investigation regarding the possible use of illicit drugs (8, 9).

REFERENCES:

1. Fortis AA, Nikolaou HD, Zidianakis VM, Maguina NM. Ischemic srtoke in a young man following ecstasy abuse: Acase report. The Internet Journal of Emergency and Intensive Care Medicine. 2005 Volume 8, Number 1.
2. Milroy CM, Clark JC, Forrest ARW,. Pathology of deaths associated with "ecstasy" and "eve" misuse. J Clin Pathol 1996;49:149-153
3. Auer J, Berent R, Weber T, Lassnig E, Eber B. Subarachnoid haemorrhage with "Ecstasy" abuse in a young adult. Neuorl Sci.2002;23(4):199-201
4. Manchanda S, Conolly MJ. Cerbral infarction in association with Ecstasy abuse. Postgrad Med J. 1993;69:874-5
5. Vallee JN, Crozier S, Guillevin R, Obadia M, Lo D, barragan-Campos HM, Samson Y, Chiras J. Acute basilar artery occlusion treated by thromboaspiration in a cocaine and acstasy abuser. Neurology 2003;61:839-841 5
6. Reneman L, Habraken JB, Majoie CB, Booij J, den Heeten GJ. MDMA ("Ecstasy") and its association with cerebrovascular accidents: preliminary findings. AJNR Am J Neuroradiol. 2000;21(6):1001-7
7. Bruno A. Cerbrovascular complications of alcohol and sympatomimetic drug abuse.Curr Neurol Neurosci Rep.2003;3(1):40-5 (Abs)
8. McEvoy AW, Kitchen ND, Thomas DG. Intracerebral haemorrhage and drug abuse in young adults. Br J Neurosurg 2000;14(5):449-54
9. MDMA/Ecstasy Research:Advances, challenges, future directions . Ascientific conference executive summary. Available from http://www.drugabuse.gov/meetings/MDMA/MDMAExSummary.html