Accidental intoxication with high dose of methoxetamine (MXE) - a case report

Przypadkowe zatrucie dużą dawką metoksetaminy (MXE) - opis przypadku

Metoxetamine (MXE) is an analogue of ketamine. Case report: We present a 25-year-old male who, after getting an information from the Internet, started to use MXE to avoid the excitement connected with recreational codeine abuse. For about 8 - 10 months he injected about 100 mg of MXE intramuscularly. On the day of admission the patient decided to take much higher dose of 750 mg of MXE. For the first 3-4 hours of hospitalization the profound agitation, which demanded the usage of high doses of benzodiazepines, was observed every several minutes. After 6-7 hours of supportive treatment the patient returned to his baseline mental status. Conclusion: MXE presents the new healthcare threat because of easy accessibility via Internet, and lack of legal restrictions in many countries. The low dose of MXE can cause "peace and serenity", however, higher dose may act opposite.

Introduction
Metoxetamine (MXE) is an analogue of ketamine (figure 1), that is easily available via Internet. According to the best of our knowledge this is the second report of intramuscular abuse with MXE in medical literature [1-7].

Case report
A 25-year-old male, with the history of alcohol and codeine abuse, was admitted to the Toxicological Unit (TU) because of coma (GCS 9) and suspicion of intoxication with unknown psychoactive substance. According to the amnestic the male was addicted to alcohol for about 5 years. He was diagnosed and treated in outpatient clinic with olanzapine, and valproic acid, however, he did not take prescribed medicines regularly. About three years ago the patient gave up drinking, and started of recreational abuse with codeine in the average dosage of 600 - 1000 mg/day.

Because of agitation, excitement, and nervousness related to codeine usage he has started to ingest benzodiazepines, barbiturates, and marijuana. About one year earlier, after getting an information from the Internet, he started to use MXE to avoid the excitement after codeine abuse. The pure MXE was bought by him in UK as a substance used in chemical laboratory. For about 8-10 months he injected 100 mg of MXE about 3 h before ingestion of codeine tablets. According to him, methoxetamine, in this dose, make him calm and relaxed despite the use of high dose of codeine.

On arrival to the hospital the patient was oriented but sleepy, his temperature was 37.0°C, heart rate 68-140/min, blood pressure 110-180/70-100 mm Hg, respiratory rate 16-20/min, and oxygen saturation 99% (room air). Heart and lung sounds were clear. His abdomen was soft, and non-tender with normal bowel sounds. Neurological exam was normal. On the skin of the right buttock there were many signs of intramuscular injections. The complete blood count, and basic metabolic panel were normal. In urine examinations there were no cocaine, amphetamine, methamphetamine, benzodiazepines, and barbiturates.

For the first 3-4 hours of hospitalization the profound agitation which demanded the usage of high doses of benzodiazepines, and safety (immobilization) belts was observed. During agitation: tachycardia, with the rise of blood pressure, and orientation to name only were not-ed. After 6-7 hours of treatment the patient returned to his baseline mental status.

He stated that before admission he self-injected 750 mg of MXE in his right buttock. About 3 hours later he has taken his usual dose of 80 tablets of NeoAzarine, which consist of 10 mg of Codeine phosphate, 316 mg pulverized thyme herb, anise oil, potato starch, lactose monohydrate, powidon, talc, and macrogol 6000. About one hour later the patient lost his consciousness and woke up in the hospital. After a 24 hours of hospital stay the patients was discharged home on his own demand.

Discussion
Since the turn of 21st century, there has been the increase in the usage of novel psy-
choactive substances, known as "legal highs" across all over Europe [6].

One of "legal highs" is methoxetamine [2-(3-methoxyphenyl)-2-(ethylamino) cyclohexanone], an arylcyclohexylamine congener of ketamine and phencyclidine [2-4].

For global market MXE is synthesized in China and then ship to Europe or USA. The price differs from 5 to 18 pounds for one gram dependent how much substance is ordered. Although Internet vendors state that MXE is not for human consumption, the drug is used for recreational, illicit purposes [2,4].

According to the best of our knowledge there are currently no legal restrictions for methoxetamine in the USA, UK, Russia and Poland.

Everybody can buy MXE and find sort of advertisement of it on the web site (www.methoxetamine.co.uk):

1. "Being a close structural relative of Ketamine means that it offer many exciting areas of laboratory research."

2. "No license is currently required in the UK to utilise methoxetamine as a laboratory reagent. It is however, not approved for in-vivo research or experimentation."

The substance is white, and odorless, and is sold via Internet as a "narcotic" which is serious side effect [2,4].

The main problem for clinical toxicologists and ED doctors is limited information available on the potential acute toxicity associated with the use of such substances [6].

The exact mechanism of action is not known yet, however, NMDA receptors blockade and dopamine reuptake inhibition may play an important role in it [4]. The main road of administration is oral, and insufflations, however, Ward et al. suggest that intramuscular, rectal, and intravenous roads are also popular [4]. The usual sublingual and buccal dose varies from 5 to 100 mg, insufflated dose varies from 5 to 100 mg, rectal dose varies from 5 to 70 mg, and intramuscular dose varies from 5 to 40 mg [4].

The clinical picture may vary depend on the dosage, previous usage of this substance and the source of MXE. According to Shields et al. methoxetamine may cause rapid onset of neurological impairment, characterized by acute cerebellar toxicity including ataxia, incoordination, imbalance, slurred speech, and reduced conscious. Spontaneous recovery was observed, however, the duration of cerebellar problem may extend up to several days [3]. Wood et al. and Hofer at al. suggest that MXE make similar state to that seen during ketamine use. The authors observed acute sympathomimetic state with tachycardia, hypertension, confusion, agitation, stupor, mydriasis, and nystagmus [1,7]. In our case the profound agitation accompanied with tachycardia and hypertension, lasted for the first few hours of hospitalization, dominated in the clinical picture.

The quick laboratory examination seems to be difficult in clinical practice. Westwell et al. advice to use gas chromatography-mass spectrometry (GC-MS) and nuclear magnetic resonance (NMR) spectroscopy, however, all these equipment are not common in all hospital laboratories [5].

The level of MXE in the serum of patients with clinical signs of intoxication varied from 0.16 to 0.45 mg/l [3].

Our patient used to inject about 100 mg of MXE intramuscular just to avoid an excitement caused by co-ingestion of codeine. For all this time he did not noticed any excitement and agitation connected with the usage of codeine with MXE, while there were such problems with recreational abuse with codeine alone. The sudden increase of MXE to the dose of 750 mg caused profound agitation which lasted for a few hours.

Conclusions
MXE presents the new healthcare threat at because of easy accessibility via Internet, and lack of legal restrictions in many countries.

The low dose of MXE can cause "peace and serenity", however, the high dose may act opposite.

References