Case report: Mephentermine misuse and psychosis

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Abstract
Mephentermine is structurally similar to methamphetamine and is banned by world anti-doping agency due to its abuse as performance enhancing drug. Reports of Mephentermine abuse and dependence are emerging recently in competitive sports which might lead to psychosis and harmful effects. Here we describe a case of Mephentermine misuse in a body builder prescribed by his trainer in gym which led to psychosis. The client showed improvement with parenteral haloperidol and promethazine combination followed by oral haloperidol and motivation enhancement therapy. Our case report highlights the need of effective treatment options and spreading awareness regarding harmful effects among athletes and also need of the vigilance on drugs availability in gym which further emphasizes to concentrate on this area by the policy makers.

Keywords: Mephentermine abuse, Gym trainers, Psychosis, Dependence, Performance enhancer.

Introduction
Mephentermine is a member of amphetamines with structure similar to methamphetamine and IUPAC name *N*, 2-dimethyl-1-phenylpropan-2-amine. It mainly acts by inhibiting monoaminoxidases A and B.[1] Traditionally used as a vasoconstrictor to maintain blood pressure in cases of hypotension during spinal anesthesia in patients undergoing elective caesarean section procedures and pregnancy.[2] Both mephentermine and phentermine are stimulants whose use is prohibited by the World Anti-Doping Agency (WADA).[3] Nowadays it is restricted to veterinary use for fatigue, anemia, malnutrition and recovery from infectious and parasitic diseases.[4] Mephentermine along with other anabolic steroids has been misused by athletes of age group 20-30 years to increase performance and endurance.[5] On review of literature, we have found case studies like Mephentermine dependence with psychosis[6] and without psychosis.[7] As number of cases of Mephentermine are increasing due to poor vigilance by government management protocols are not clear, hence proper guidelines shall be drafted.

We present a case of Mephentermine misuse with psychosis which is first of its kind in south India

Case Presentation
Mr X a 26 year old married male who is a competitive body builder by profession hailing from urban area of Telangana state with no past history of mental illness and history of mental illness in paternal grandfather presented to Retreat hospital, Hyderabad in the month of November 2020. He reports occasional use of alcohol with friends starting at the age of 18 years and no history of smoking or other substance use. He took body building as a profession at 19 years of age, initially he tried naturally as there was no progress, on advice of the senior trainers he started using anabolic steroids regularly for gaining muscle mass following which he had won three district and one state level medals at the age of 24 years. He continued using them for one more year due to which he gained lot of weight and reached body mass index of 30. He had complaints of sleep impairment and emotional dysregulation at that time. Later in October 2019 he decided to train in calisthenics for which the required body fat should be under 10%. In order to attain that, with advice of his senior trainers he started Mephentermine which he procured from local pharmacy. Initially he used to get administered by his friend who works in nearby hospital as male nurse and later on learnt himself when frequency increased. Following the first IV dose he perceived increased energy, endurance, pleasurable sensation, nerve stimulation, and increased boost for exercise.He started at the dose of 75 mg per day which is a prescription dose among trainers in three divided doses intravenous for almost 4 months. In this duration he reports loss of appetite, impaired sleep, emotional dysregulation and occasionally suspiciousness towards wife. There were no withdrawal symptoms reported in this duration even with dose reduction. He stopped going to other works and spent all his money to procure the drug, he used to lend money from his friends if he doesn't have enough money later sought money from local sponsors. He increased the dose to 100-120 mg per day gradually. He developed more suspiciousness, sleep impairment, irritability, auditory hallucinations, visual hallucinations and suicidal ideations. However our client didn't fulfil diagnostic criteria for dependence. On 11th November 2020 he had a quarrel with wife and attempted suicide by taking almost 500-600 mg intravenous Mephentermine in single dose due to which he developed severe restlessness, auditory and visual hallucinations. He realized that his suicide attempt failed so he jumped from a two storied building and was presented to the emergency room.

On examination he was conscious and oriented, abrasions were seen on right arm and multiple needle puncture wounds on both arms. CNS examination was normal along with neuroimaging to rule out head injury or organic cause.

Cardiovascular examination revealed pulse rate of 110 beats /minute and blood pressure 150 mmHg systolic and

100 mmHg diastolic, echocardiogram was normal. Blood investigations like hemogram, renal function test, liver function test, blood sugars and lipids were normal. Mental status examination revealed depressed mood, paranoia, auditory hallucinations of first and second person type and visual hallucinations.

After admitting him as inpatient we have administered Brief psychiatric rating scale (BPRS) which gave a score of 58. We treated the psychosis with parenteral haloperidol and promethazine. He developed hypotension and was corrected with intravenous fluids. During the course of hospital stay we observed for withdrawal symptoms which he apparently didn't show. We switched to oral haloperidol along with motivation enhancement therapy which showed 80% reduction in BPRS score hence discharged. In outpatient follow up slowly tapered down the dose of haloperidol and continued only on motivation enhancement therapy weekly two sessions for maintenance for which he showed good response and maintaining abstinence.

Discussion

Mephentermine misuse may have significant clinical implications because of its association with psychosis and cardiovascular effects like hypertension, arrhythmias and risk of sudden death.[4]

Our case is first of its kind to be reported in south India. Case report was published from north India in which young athlete had Mephentermine dependence.[8] Mephentermine usage can be seen especially in body building field due to constant need to maintain body endurance. The stress of competitive sports which may lead to the drug abuse and eventually to dependence. In our case client had used low doses of Mephentermine similar to a case report in which gym trainers prescribed Mephentermine to their clients.[9] Our client developed psychosis even with low doses similar to a series of case reports[6] in other hand case reports without psychosis even with high doses were found.[7,10] This can be explained by the higher genetic vulnerability to psychosis in our client. We have given only antipsychotics like haloperidol combining with promethazine to treat the psychosis as another case report suggest use of antipsychotics in treating psychosis.[11] Our client didn't have any withdrawal symptoms during the stay in the hospital. Case report suggests usage of bupropion as the most common drug for withdrawal symptoms.[12] Reports on mephentermine abuse in athletes have been increasing due to lack of awareness regarding potential of dependence and its effects. Our case report highlights the need for availability of resources for drug detection in the body and spread awareness regarding the harmful effects of the drug in common public as well as medical professionals who often come across such cases. Efforts are needed to improve treatment and management strategies. Health care community along with policy makers need to deal with this challenge. We would suggest a strict vigilance and monitoring by government agencies regarding availability of Mephentermine and anabolic steroids in gyms and propose conducting of awareness programmes by government and non-government organizations (NGOS) in gyms regarding misuse of drugs, steroids and their harmful effects to human body. To know the course and outcome of Mephentermine misuse or dependence we suggest further long term studies.

Conflict of Interest

The authors declare no conflict of interest.

Patient Consent

Written informed consent has been obtained from the patient.

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