CASE REPORT

AMPHETAMINE-INDUCED PSYCHOSIS LEADING TO HOMICIDE, SUICIDAL ATTEMPTS, AND DISORIENTATION: A CASE REPORT

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Amphetamine abuse leads to severe psychiatric and cardiovascular complications–psychosis, hallucinations and aggressive behavior. A 34-year-old male of five years noted history of amphetamine abuse and presented with amphetamine psychosis characterized by hallucinations, violent ideations and a recent suicide attempt is described in this case report. Previously under the influence of amphetamines, two years prior, the patient committed homicide. Patient had periods of very severe disorientation and agitation, history of suicidal ideation and violent thoughts toward others. Toxicology screenings were done, all were consistent with amphetamine presence. Diagnostic studies included cardiac biomarker elevations and abnormal electrolyte levels. Management was immediate and involved sedation, antipsychotic therapy and cardiovascular support, followed by long term psychiatric care and substance abuse rehabilitation. Here, chronic amphetamine abuse is shown to have profound psychiatric and behavioral effects and to require integrated treatment strategies to meet the complex needs of such patients.

Keywords: Amphetamine abuse; Psychosis; Hallucinations; Suicidal behavior; Violent ideations

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INTRODUCTION

Amphetamine abuse has become a pressing public health problem of global prevalence and severity. Methamphetamine and other synthetic stimulants as well as amphetamines, known for their euphorigenic stimulating properties, have a high abuse and addiction potential.[1,2] Amphetamine use increase on global basis is due to factors ranging from the increased availability, to both societal and social stressors and the improvement of cognitive and physical performance to which amphetamine use is linked.[1] Severe psychiatric conditions have followed chronic use of amphetamines, including amphetamine induced psychosis, characterized by hallucinations, paranoia and severe agitation.[3] Substantial disruptions in dopaminergic systems are the neurochemical mechanisms underlying amphetamine induced psychosis. Amphetamines are proving to be particularly good at releasing dopamine, especially from and in the mesolimbic pathway, which is critical to reward processing and reinforcement learning.[4] Whereas conventional drugs simply adjust pharmaceutical neurotransmitters based on a blood test to treat these symptoms, this is a possibility that impedes on other areas like this alteration in neurotransmitter function, which can have a full spectrum of psychiatric symptoms from mild paranoia to severe psychotic episodes.[5] The long-term psychiatric manifestations seen in users of amphetamines are made more complicated by the induction of chronic changes in structure and function of the brain by amphetamines.[6] Amphetamine use is typically chronic, and over time, these neurochemical imbalances tend to become more persistent, worsening the psychiatric symptoms.[7] Amphetamine induced psychosis often resembles acute primary psychotic disorders including schizophrenia but can be differentiated on the basis of its drug use history.[8] This condition is not easy to deal with when the possibility of aggressive behavior, violence, and even self-destructiveness in chronic users is considered. It is therefore paramount to know these manifestations so as to start developing ways of handling it. In a study it was found that psychosis, which is left without treatment, may result in severe deficits in activities of daily living and social interactions, as well as the increased level of dangerous behaviour.[9] The complexity of the disorder requires that management approach be multimodal which involves psychiatric evaluation, pharmacological treatment, and substance use treatment.[10]

CASE REPORT

Male patient aged 34-years with a history of amphetamine was brought to emergency ward, Amna Hospital Sialkot after he survived a suicidal attempt. He had been using amphetamines daily for the last five years, which gradually progressed. Two years before

the current presentation, the patient killed his 10 years old nephew during psychosis due to amphetamines use. During that period, he had perceptual disturbances, in the form of hallucinations and delusional manifestations that precipitated acts of violence. The patient was arrested but was later detained in a jail for a short time because he was declared mentally unfit to stand a trial. He was prescribed antipsychotic medication but was non-compliant; this together with substance abuse and psychiatric instability persisted. The patient was taken to the emergency department after attempting to commit suicide by jumping off the roof of a two storied building. It has been a few weeks since his family received complaints about him screaming and telling them false things, and physical aggression toward them. In this period, he used to talk nervously about the violent intentions towards his family members and used to believe that his family members have ill intentions against him. He had severe paranoid symptoms and high levels of impulsiveness, which degenerated into suicide measures before the study. At admission, the patient was noted to be severely agitated, paranoid. He was incoherent and would often go from agitated activities. Psychomotor agitation was noted with difficulty maintaining focus in Mental Status Examination. The conditions he had included were delusions of persecution and auditory hallucinations that the voices commanded him to harm others. His behavior varied from irritable to tearful. He became intermittently disoriented to time and place and every now and then announced that he was aware of what he was doing. The patient was agitated and restless, alternately sitting and reclining, and was unable to sit still, as Physical Examination showed. He probably had some form of hypertension and tachycardia with the onset owing to his psychotic state and substance use. During the examination there were no focal neurological deficits. The following investigations were conducted to assess the extent of the patient's condition and to guide treatment.

Test	Result	Normal Range
Urine Toxicology	Positive for amphetamines	Negative
Complete Blood Count (CBC)	WBC: 10.2 x 10^9/L	4.5–11 x 10^9/L
	Hemoglobin: 13.8 g/dL	13.0–17.0 g/dL
Liver Function Tests (LFTs)	ALT: 38 U/L	10–40 U/L
	AST: 42 U/L	10–40 U/L
Electrolytes	Sodium: 140 mmol/L	135–145 mmol/L
	Potassium: 4.0 mmol/L	3.5–5.0 mmol/L
Brain MRI	No acute abnormalities	-
EKG	Sinus tachycardia	60–100 bpm
Psychiatric Evaluation	Amphetamine-induced psychosis; high risk of self-harm and aggression	-

The patient confirmed a history of amphetamine use that had become increasingly frequent and intense over the past 5 years. The patient's family stated that over the past year, they had observed escalating aggression, followed by a pattern of erratic behavior, then bad compliance with psychiatric treatment, only to have it fail. In addition, the patient reported multiple failed attempts to quit, only partially complying with psychiatric treatment. In the past the family had sought psychiatric help but were unsuccessful due to the noncompliance of the patient. The patient also had amphetamine induced psychosis, with recurrent episodes of severe paranoia and hallucinations. Severe agitation and drug induced sedation were managed with a combination of antipsychotic medications risperidone and olanzapine and benzodiazepines to stabilize the patient. In addition to treatment of evident hypertension and tachycardia, the patient was also given cardiovascular support. The patient was stabilized first and then admitted to psychiatric ward for further management. An overall treatment plan was established consisting of continuing antipsychotic therapy, cognitive behavior therapy, and a didactic structured substance abuse rehabilitation program. Rehabilitation program was based on motivational interviewing and recovery prevention strategies, emphasizing both psychological aspects of addiction and behavioral modification necessary to keep one abstained from addiction.

DISCUSSION

This case illustrates the great effect of chronic amphetamine abuse on mental health, with an academic approach to amphetamine psychosis with hallucination, ideation of violence, and a suicide attempt. Vulnerable patients like this with a history of prior violent behavior, including the murder of his nephew, have severe risks in this context, provoked by untreated psychotic episodes exacerbated by stimulant use. Amphetamines are known to primarily act in the brain by causing an enormous increase in dopamine release, thereby raising mood and alertness.[11] However, when it is used chronically this disrupts normal dopaminergic function, causing a variety of psychotic symptoms, including hallucinations and paranoia. Amphetamine induced psychosis is primarily a result of over dopaminergic activity in the mesolimbic pathway, a critical brain circuit responsible for emotional and reward responding, although other neurotransmitter systems contribute.[5,12] It results in robust psychiatric

symptoms (delusions, violent ideation), and it is highly disruptive. There is consistency with other severe amphetamine induced psychosis case reports in which intense paranoia, agitation, can precipitate dangerous behaviors.[13] This patient's past suicide attempt identifies amphetamine use as a high risk for suicide; and, as a result, the emphasis is on the urgent requirement for effective methods of managing both acute symptoms and underlying substance abuse.[14,15] Persons with stimulant use disorders are at increased risk for suicidal behavior, with evidence that the risk is especially elevated during an acute psychotic episode.[16] Severe psychiatric symptoms in combination with substance induced mood disturbances greatly increase the risk of self-harm. Integrated treatment of this risk includes a combination of pharmacological and psychiatric care along with rehabilitation for substance abuse.[17,18] Treatment of acute amphetamine induced psychosis involving hallucinations, violent ideations, and suicidal behavior requires long term management strategies for both the acute psychosis and prevention of substance abuse which tends to relapse and can precipitate psychiatric symptoms and suicidal behavior.[19,20] The management of amphetamine-induced psychosis, to be effective, is accomplished by a combination of pharmacological and psychiatric treatment as well as substance abuse rehabilitation.[13,21] to address the complex needs of individuals with amphetamine-induced psychosis and to decimate risks of morbidity behaviors. Rehabilitation and psychiatric support services are structured to prevent relapse and promote long term recovery in persons with severe amphetamine disorders.[17,18]

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