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Case Series

Psychiatry/Mental Health Section

Varying Course and Outcomes in Mephentermine-induced Psychosis: A Case Series

ARCHANA JAVADEKAR[1], SINDHUJA BALU[2], SHRAVANI JAVADEKAR[3], MUKESH PATEL[4]

ABSTRACT

Mephentermine, a sympathomimetic amine commonly used to treat hypotension, is increasingly being misused for its stimulant and euphoric properties, particularly among young adults. Despite its structural similarity to amphetamines, reports of mephentermine-induced psychosis remain rare in the literature. This case series presents three young adult males who used mephentermine from one month to one year and developed acute psychotic symptoms. Presentations ranged from fear to hearing voices to aggression. They all had different lengths of recovery period. This emphasises the role of early detection and treatment. One patient responded rapidly to low-dose risperidone and achieved remission within two weeks. Another, with a prolonged history of use and more severe symptomatology, required antipsychotics and Electro Convulsive Therapy (ECT), yet showed only partial improvement. The third patient, with a prior psychiatric history and concurrent cannabis use, demonstrated significant symptom reduction with mood stabilisers and supportive care. The spectrum of presentations, ranging from brief psychotic episodes to treatment-resistant states mimicking schizophrenia, highlights the variability in clinical outcomes based on duration, dose, and co-morbid vulnerabilities. These cases underscore the need for increased clinical vigilance regarding stimulant misuse, especially injectable mephentermine, and the importance of early detection and comprehensive management strategies. Given the limited existing literature, this report aims to contribute to the understanding of mephentermine-induced psychosis and draw attention to its growing misuse in non-medical settings.

Keywords: Adverse effects, Amines, Pharmacokinetics, Toxicity

INTRODUCTION

In clinical psychiatry, substance-induced psychotic illnesses remain difficult to diagnose and treat, especially when less frequently abused substances are involved. As per World drug report 2025 there are 56 newly identified Psychoactive Substances (PAS) in 2023 [1]. Research clearly shows that the use of PASs can contribute to the emergence of various psychiatric disorders especially Substance-induced Psychotic Disorders (SIPD) [2]. The challenge for clinicians is to diagnose whether it is primarily a psychotic disorder or psychosis pertaining to intake of PASs. The Diagnostic and statistical manual of mental disorders, fifth edition defines the substance induced psychotic disorder as a psychiatric disease featured by delusions and/or hallucinations during or soon after substance intoxication or withdrawal [3]. Substance induced psychotic disorder was first introduced in 1994. This diagnostic category was developed to distinguish substance-related psychotic disorders from primary psychotic disorders and was shaped based on recommendations from the substance use disorders work group [3]. PAS are the chemical compounds that act on the central nervous system and lead to various disturbances in mental state, mood, perception, behaviour, and motor functions [2]. Substance induced psychotic disorder depend upon type, dose, frequency, genetic as well as environmental factors [2]. Psychoactive drugs can be classified into three categories: stimulants, hallucinogens, and depressants. These drugs do have various medical benefits but are misused due to their pleasurable effects oblivious to their hazardous consequences [4].

Mephentermine, a sympathomimetic amine, is primarily used for its vasopressor effects to treat hypotension, particularly spinal anaesthesia-induced hypotension [5]. Mephentermine's action on monoaminergic synapses releases monoamines such as noradrenaline, dopamine, and serotonin [6]. It is used to treat hypotensive episodes, which often precede shock, myocardial infarction, spinal anesthesia, or other serious medical conditions [7,8]. Both mephentermine and phentermine are stimulants that produce feelings of relaxation and euphoria. The World Anti-doping Agency forbids the use of both in sports; mephentermine and phentermine [9,10]. However, its potential for misuse due to its stimulant properties is a growing concern. Demethylation of mephentermine produces amphetamine, a strong releaser of dopamine, and noradrenaline, a known psychostimulant, which can lead to severe neuropsychiatric side-effects, including psychosis [11,12]. Psychotic symptoms induced by mephentermine can range from mild paranoia to severe delusions and hallucinations [13]. Despite mephentermine's increasing abuse in non-medical contexts, mephentermine-related psychosis is still a little understood condition among many sympathomimetic medications.

CASE SERIES

Case 1

An 18-year-old unmarried male, educated up to the 12th standard and currently unemployed, His primary language was Marathi and Hindi, residing with his parents and younger sister, presented to the Outpatient Department with complaints of abrupt-onset fearfulness, suspiciousness, and perceptual disturbances since two days. The presenting symptoms began two days after an argument with a friend who allegedly threatened to kill him. Since then, the patient experienced intense fear that someone was going to harm him, and the belief that people were talking about him, and reported hearing the voices of his friends threatening him in the absence of external stimuli. These symptoms were accompanied by decreased sleep and appetite.

There was no significant past psychiatric or medical history and no relevant family history of psychiatric illness. Schooling history revealed behavioural issues including truancy and disrespect towards teachers. The patient reported a history of social alcohol

consumption and daily tobacco use for the past 3-4 years, consuming approximately half to one packet per day.

Upon detailed inquiry, the patient disclosed that he had been using intravenous injectable mephentermine (30 mg/mL) for one month prior to admission, typically 2-3 mL every 3-4 days, along with his friends. He had been abstinent for eight days before presenting to the hospital. On Mental Status Examination (MSE), the patient appeared unkempt, fidgety, and fearful. Rapport was established with difficulty. Motor activity was increased, mood was expressed as "afraid," and affect was distressed. Thought content revealed delusions of persecution, and perceptual disturbances included second- and third-person auditory hallucinations. The patient demonstrated partial insight with impaired judgment.

Physical examination showed a BMI of 23.1 kg/m^2, pulse rate of 102 beats per minute, and blood pressure of 130/90 mmHg. Track marks were noted on his forearms. Systemic examination was within normal limits. Baseline laboratory investigations including liver, renal, and thyroid function tests were normal. Provisional diagnosis was acute and transient psychotic disorder induced by specific PASs which was confirmed from history of substance abuse as well as injectable track marks. The patient was started on risperidone 2 mg/day, which was gradually increased to 4 mg/day, along with trihexyphenidyl 4 mg/day. He likely had drug-induced psychosis that resolved within 14 days with antipsychotics and stopping mephentermine. At follow-up of six months, he remained abstinent from mephentermine and asymptomatic.

Case 2

A 23-year-old unmarried male, educated up to first-year B. Com, unemployed for the past eight months, and living with his parents and younger brother, presented to the Emergency Department with symptoms of irritability, aggression, suspiciousness, and persecutory delusions. He was fearful that people were plotting against him and that his family members were trying to poison him since eight months. The patient was right-handed, from a lower socioeconomic background, and fluent in Hindi, Marathi, and English.

According to his father, the patient had been spending more time with friends for the past year, returning home for meals. He claimed to be working on a business with his friends and had quit his job in January 2023. Over the past eight months, his family observed increasing irritability, argumentative behaviour, and heightened suspiciousness toward them. Four days before admission, the patient had a verbal altercation with family members and left home. He was subsequently found by a friend, whom he had approached for protection due to persecutory beliefs that certain individuals were attempting to harm him.

The patient admitted to intravenous use of mephentermine, approximately 1-2 mL three times a day for the past 10-12 months. He reported the last use was one week before admission. There was also a history of cannabis use 2-3 years ago. The patient consumed alcohol occasionally with friends and had no other significant medical, surgical, or psychiatric history. There was no family history of psychiatric illness.

On MSE, the patient was kempt and moderately groomed but was visibly agitated, pacing in the casualty area, and appeared fearful. He was conscious, communicative, oriented to time, place, and person, but uncooperative. He initiated but did not maintain eye contact. Motor activity was increased, and his speech was spontaneous, coherent, and relevant with normal rate, tone, volume, and reaction time. Mood was described as "not good" with a perplexed and distressed affect. Thought content revealed delusions of persecution and reference, as well as misidentification. He denied hallucinations. Insight was absent, and judgment was impaired.

On physical examination, his pulse was 110 beats per minute. He was normotensive. Track marks from intravenous injections were visible on his forearms. Initially, he refused systemic examination fearing harm from the medical staff. After reassurance, the systemic examination was completed and found to be within normal limits. Baseline laboratory workup including haemogram, liver function, and renal function tests was within normal limits. Provisional diagnosis was acute and transient psychotic disorder induced by specific PASs which was confirmed from history of substance abuse as well as injectable track marks. The patient was started on injectable haloperidol 5 mg BD and promethazine 25 mg BD for acute agitation, and oral olanzapine which was titrated up to 20 mg/day. Due to persistent aggression and grieveous psychotic symptoms, he received a course of six Electroconvulsive Therapy (ECT) sessions. After one month, psychotic symptoms reduced, but residual suspiciousness remained. On follow-up of a month, extrapyramidal side-effects like tremors and mild rigidity emerged, leading to a dose reduction of antipsychotics. The patient reported abstinence from mephentermine and tobacco, with improved sleep, appetite, and no active fear or suspiciousness.

Case 3

A 23-year-old married, educated up to 10th standard, non-functional for the past week, living with his mother while his wife resided in Pimpri, presented to the Outpatient Department with complaints of muttering to self, gesturing in the air, irritability, anger outbursts, pacing behaviour, and reduced sleep and appetite. These symptoms were present for 4-5 days before admission.

The patient reported intravenous mephentermine use for the past three months, initially 3-4 times a month, and daily for the five days leading up to admission. His condition may have been a mix of drug effects and an underlying personality difficulties. He last used 2 mL of mephentermine intravenously the night before presentation. Additionally, he had a history of cannabis use for seven years, which increased from occasional use to daily use by 2022. He reported one-month abstinence in October 2023, with only three instances of use since, the last being six days before admission. The patient had a prior psychiatric admission in October 2024 for similar symptoms and was discharged on divalproate 1000 mg HS. He also had a history of impulsive self-harm in 2023 following a verbal altercation with family, which resulted in tendon injury requiring admission in plastic surgery. Past medical history included appendectomy at age 12. He reported occasional alcohol consumption (90-180 mL every 3-4 months), last consumed in July 2024. On MSE, the patient was unkempt, dishevelled, restless, and uncooperative. He was oriented and appeared appropriate to his stated age. He was arguing with his mother, had a runny nose and watery eyes, and persistently requested to go home. Eye contact was maintained intermittently. Motor activity was increased. Though his attitude was respectful, rapport was difficult to establish. Mood was conveyed as restless with an irritable and reactive affect. He lacked insight and had impaired judgment.

On general examination, his pulse was 132 beats per minute, and he was normotensive. Injection track marks were noted on his forearms. He was referred to Department of Cardiology for evaluation of tachycardia and palpitations. Electrocardiogram (ECG) and Two-dimensional (2D) echocardiography were within normal limits. Haemogram, liver and renal function tests, and serology were also normal. Provisional diagnosis was acute and transient psychotic disorder induced by specific PASs which was confirmed on history of substance abuse as well as injectable track marks. The patient was started on divalproate 500 mg, up-titrated to BD dosing, and lorazepam 3-4 mg in divided doses for sleep disturbances, which was tapered off subsequently. He showed significant improvement in psychotic symptoms within 3-4 days and was discharged on request after 10 days, stable on divalproate 500 mg BD.

DISCUSSION

The presented case series is an attempt to show, how mephentermine-induced psychosis can present as a spectrum ranging from minimal psychotic symptoms to a persistent psychosis mimicking a schizophrenia-like illness and may require a course of ECT. In presented case series, all three patients were young males in their early twenties, belonging to lower or lower-middle socioeconomic strata. All had histories of substance use, including tobacco and alcohol, with two reporting cannabis use, and all admitted to intravenous mephentermine use ranging from a few weeks to over a year. Their presentations were marked by a sudden onset of paranoid ideation, irritability, aggression, and auditory hallucinations, consistent with previously described amphetamine-induced psychoses.

Case 1 presented with classic paranoid psychosis following one month of i.v. mephentermine use. The acute onset of second- and third-person auditory hallucinations, persecutory delusions, and partial insight, in the absence of other substance use or psychiatric history, supports a direct causal link between mephentermine and psychosis. Notably, the patient responded well to low-dose risperidone and achieved remission within two weeks, consistent with literature suggesting that mephentermine-induced psychosis may resolve rapidly with abstinence and appropriate antipsychotic therapy. In contrast, case 2 had a more insidious onset over several months of heavy daily use (1-2 mL, three times a day), with prominent aggression, misidentification, and persecutory delusions. Despite antipsychotic therapy and six sessions of ECT, residual suspiciousness persisted after one month. This case aligns with prior reports indicating that prolonged high-dose stimulant use may lead to more treatment-resistant or lingering psychotic symptoms, as seen in amphetamine psychosis [14,15]. His partial response, despite intensive treatment, raises the question of neuroadaptive or sensitisation effects from chronic mephentermine exposure, which may alter dopaminergic signaling or frontal lobe function.

Case 3, though similar in the clinical picture, was complicated by a past psychiatric admission and significant cannabis use. Despite a shorter duration of mephentermine use (3 months, daily use in the 5 days prior to admission), his psychosis presented abruptly with prominent irritability, pacing, and disorganised behaviour. Interestingly, he responded favourably within 3-4 days to mood stabiliser (divalproate) and supportive care, indicating a possible affective or mixed psychotic state, possibly exacerbated by stimulant use in a vulnerable individual. Given his prior admission and self-harm history, an underlying bipolar spectrum disorder with substance-induced exacerbation cannot be ruled out.

Very few published case reports detail mephentermine-induced psychosis [13]. A young bodybuilder who used mephentermine under the supervision of a gym trainer developed psychosis, according to the case reported by Ayyalasomayajula R et al., [16]. Delusions and hallucinations were among the symptoms, which were similar to the current instance and went away with antipsychotic medication. In contrast to the abrupt presentation in this instance, the prior report noted a more gradual onset of symptoms. This discrepancy could result from different dosages, usage length, and individual susceptibility. Vishwakarma A et al., documented another case of mephentermine-induced psychosis in a 23-year-old professional weightlifter where symptoms persisted for a longer duration, requiring a more extended treatment regimen [17]. In contrast, our patient's symptoms resolved rapidly, likely due to the prompt initiation of treatment and relatively short history of drug misuse. The literature also notes that psychostimulant-induced psychosis can exhibit a wide range of severity. Factors such as co-morbid substance use and underlying psychiatric vulnerability may influence outcomes [18,19]. In this case, the absence of additional substance misuse or a significant psychiatric history likely contributed to the favourable response to treatment. Similarly, Kumar PS et al., reported psychosis in a sportsman using mephentermine as a performance enhancer [20].

Compared to these reports, the current case series reveals several distinct clinical and public health concerns. All three cases involved intravenous mephentermine, which is not commonly reported in the literature. The use of injectable mephentermine outside medical settings, especially among youth, signals a dangerous trend of misuse, with higher bioavailability and abuse potential. Secondly, the duration and frequency of use varied, with the most chronic user (case 2) showing the poorest response, indicating a probable dos e-response relationship in the severity and duration of psychosis. Cannabis use was noted in cases 2 and 3. The role of cannabis as a potentiator of stimulant-induced psychosis is well established, and these cases reinforce the risk of synergistic effects when mephentermine is used concurrently with other psychotogenic substances. While case 1 responded quickly to standard antipsychotic treatment, cases 2 required augmentation with ECT and still had residual symptoms. Case 3 showed rapid improvement but had a prior psychiatric history, raising concerns about underlying vulnerabilities or dual diagnosis. This variation in outcomes illustrates the heterogeneity of stimulant-induced psychosis, influenced by individual vulnerabilities, dose, duration, comorbidity, and social context.

The current series demonstrates that mephentermine-induced psychosis presents with a recognisable clinical syndrome that mimics acute schizophrenia or substance-induced psychosis but has a wide variability in response to treatment. It also highlights the need for early detection, detailed substance use history, and integrated management approaches, including detoxification, psychiatric stabilisation, and psychosocial interventions. Rational prescribing and regulation of mephentermine, especially in regions where injectable formulations are easily available, is crucial. Its potential for abuse, particularly among young individuals seeking performance enhancement or recreational euphoria, remains underestimated. As a case series from three young males from a single demographic group, they lack generalisability. Objective confirmation of drug use (e.g., toxicology screening) was not performed, which would have further strengthened the diagnostic certainty. Follow-up is limited to acute inpatient management; longer-term outcomes and relapse rates are not explored.

CONCLUSION(S)

Mephentermine is an easily accessible and inexpensive stimulant which is recommended by unqualified individuals to improve body performance. Due to the stimulant effects which cause enhanced performance and euphoria, mephentermine is commonly misused. There is a complex relationship between amphetamine use and psychosis. Most of the time, it is a short lasting psychosis which recovers with use of antipsychotics and cessation of mephentermine use. Sometimes it may have a prolonged course and may require ECT. Further research is needed to understand why certain individuals are more vulnerable to amphetamine induced psychosis and prolonged course of illness.

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PARTICULARS OF CONTRIBUTORS:
1. Head, Department of Psychiatry, Dr. D. Y. Patil Medical College Hospital and Research, Pune, Maharashtra, India.
2. Undergraduate Student, Department of Psychiatry, Dr. D. Y. Patil Medical College Hospital and Research, Pune, Maharashtra, India.
3. Undergraduate Student, Department of Psychiatry, Dr. D. Y. Patil Medical College Hospital and Research, Pune, Maharashtra, India.
4. Professor, Department of Psychiatry, Dr. D. Y. Patil Medical College Hospital and Research, Pune, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Sindhuja Balu,
Dr. D. Y. Patil Medical College Hospital and Research, Pune, Maharashtra, India.
E-mail: sindhujabalu781@gmail.com

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