Case Report: Vasculitis, Thrombotic Thrombocytopenic Purpura, and Disseminated Intravascular Coagulation Associated With Methamphetamine Intoxication: A Case Report

Navid Khosravi[1], Anahita Babaei[2*], Hanieh Azizi[3], Hamidreza Samaee[3]

1. Department of Emergency Medicine, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran.
2. Department of Anesthesiology, School of Medicine, Mazandaran University of medical Sciences, Sari, Iran.
3. Department of Clinical Pharmacy, Faculty of Pharmacy, Mazandaran University of Medical Sciences, Sari, Iran.

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ABSTRACT

Amphetamines and methamphetamines are two groups of substance whose use are increasing globally. Methamphetamines poisoning may develop different sympathetic symptoms; however, developing some complications, such as vasculitis, central nervous system involvement, and kidney injury. In this study, we report a case of methamphetamine poisoning that presented with loss of consciousness and developed Thrombocytopenic Purpura (TTP), Disseminated Intravascular Coagulation (DIC), and pulmonary pseud vasculitis

*** Corresponding Author:**
Anahita Babaei, PhD.
Address: *Department of Anesthesiology, School of Medicine, Mazandaran University of medical Sciences, Sari, Iran.*
Tel: *+98 (911) 3511644*
E-mail: *babaeianahita112@gmail.com*

1. Introduction

Amphetamines are a group of stimulant substances that derive from phenylethylamine and have hallucinogenic and euphorigenic properties [1]. In addition, amphetamines are used to treat narcolepsy, obesity, and Attention-Deficit/Hyperactivity Disorder (ADHD) [2]. Methamphetamine is a significant type of amphetamine, i.e., widely used in different parts of the world and case of abuse, can cause additional morbidity and mortality [3].

Methamphetamines can present central and peripheral effects on the nervous system by releasing dopamine and norepinephrine, respectively [4]. Considering the neurological impact of methamphetamines, the toxicity symptoms are related to the autonomic nervous system, including flushing, sweating, tremor, respiratory distress, and the loss of consciousness [5].

Developing vasculitis due to amphetamine and methamphetamine is rare and majorly found in the central nervous system [6]. In this study, we reported a case of methamphetamine poisoning that presented with pseudovasculitis and developed its complications including pulmonary hemorrhage, the loss of consciousness, acute kidney injury, microangiopathic hemolytic anemia, and thrombocytopenia that propose Thrombotic Thrombocytopenic Purpura (TTP) with the rise of D-Dimer (>10000), International Normalized Ratio (INR)= 4.62, Activated Partial Thromboplastin Time (aPTT) >120 and Fibrin Degradation Products (FDP) >20 is based on Disseminated Intravascular Coagulation (DIC) in hospitalization period.

2. Case Presentation

A 31-year-old man was referred to the poisoning emergency department with the Loss of Consciousness (LOC) chief complaint after consuming 32 grams of methamphetamine. The patient presented tremor, fever, sweating, tachycardia, and hypertension in addition to the LOC. Moreover, the patient had anuria, and the urine output decreased progressively in the history of illness. He was admitted to the intensive care unit and intubated due to deep coma and decreasing blood oxygen saturation.

The patient underwent supportive management by serum therapy, diazepam infusion, and morphine administration in addition to the cooling down of the body temperature. For further examination, lab tests were requested for the patient (Table 1). The patient manifested abnormality in the Blood Urea Nitrogen (BUN), creatinine, and Liver Function Tests (LFT). Moreover, the level of Creatine Phosphokinase (CPK) was significantly raised in the patient (>20000). Due to a high level of BUN, creatinine, and anuria, the patient was hemodialysis with a diagnosis of rhabdomyolysis to control renal function. After several times of hemodialysis, urine output was restored, the patient's general condition improved, BUN and creatinine decreased, and the patient was extubated.

After extubation, the patient developed respiratory distress and decreased oxygen saturation; therefore, the patient was re-intubated. A chest x-ray was used to examine the lung parenchyma. Chest radiography revealed several patchy infiltrations were detected in both lungs, and the patient was treated empirically with a diagnosis of pneumonia. Three days after the treatment, the patient developed non-massive hemoptysis. Due to the diagnosis of pulmonary vasculitis, the patient continued treatment with antibiotics by adding corticosteroids at a dose of 500 mg twice daily.

During admission, the patient's hemoglobin level decreased from 13.9 g/dL to 6.6 g/dL. Two packed cell units were injected into the patient. In addition, further lab tests were requested for rheumatologic assessments that were negative (Table 2).

Moreover, coagulation indices, including PTT, INR, Fibrinogen Degradation Product (FDP), fibrinogen, and D-Dimer, in addition to abnormal platelet levels, are listed in Table 3. Moreover, the patient was involved in previous complications with Intravascular Coagulation (DIC) and Thrombotic Thrombocytopenic Purpura (TTP). With petechiae lesions on the surface of the skin (Figure 1). Three units of fresh frozen plasma infused for DIC management.

The patient underwent plasmapheresis due to pseudo vasculitis. After twice plasmapheresis, the patient's general condition improved; accordingly, he was discharged from the hospital with outpatient treatment with corticosteroids and antibiotics.

3. Discussion

This study reported a sporadic case of pseudo vasculitis and its complications, including TTP, DIC, and multiorgan damage caused by methamphetamine intoxication. Moreover, the case of this study had further complications in addition to pseudo pulmonary vasculitis.

Table 1. Initial lab test results of the patient

Laboratory Test	Results
BUN (mg/dL)	105
Creatinine (mg/dL)	6.4
AST (U/L)	1080
ALT (U/L)	1340
Hemoglobin (g/dL)	13.9
Potassium (meq/L)	5.28
Sodium (meq/L)	143

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Methamphetamine intoxication has different symptoms such as flushed or sweaty skin, headache, tremor, agitation, also changes in consciousness and mental status [7]. The management of methamphetamine is supportive in most cases; although, immediate supportive care, including oxygenation and ventilation support, is necessary in the severe case of intoxication [8]. The subject of the current study was presented with severe sympathetic overactivity symptoms. At the first step of patient management, the patient was intubated due to the loss of consciousness and low blood oxygen level.

Pseudo Vasculitis is similar to a vasculitis; however, it does not have the pathological marking of a true vasculitis [9]. Methamphetamines may develop vasculitis symptoms through vasoactive effects, such as vasospasm, vascular inflammation, and vascular injury [10]. The vasogenic effects of methamphetamines can cause necrotizing vasculitis in different organs, such as the cardiovascular system, respiratory tract, kidneys, and liver [11, 12]. The reported patient of this study develops rhabdomyolysis symptoms, pulmonary pseudo vasculitis, Acute Kidney Injury (AKI), loss of consciousness, microangiopathic hemolytic anemia, thrombocytopenia that express DIC and TTP due to methamphetamine abuse which is a rare condition.

Table 2. The rheumatologic test data of the patient

Laboratory Test	Results
Anti-nuclear antibody (titer)	1/20
Anti-ds-DNA (IU/mL)	7
C-ANCA (U/mL)	1.1
P-ANCA (U/mL)	1.2
C3 (mg/dL)	91
C4 (mg/dL)	32
CH50 (%)	82
C1O (mg/dL)	12.4
MPO	Negative
PR3	Negative
Anti- GBM (U/mL)	0.7

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Table 3. The coagulation indices of the patient

Laboratory Test	Results
PTT (second)	>120
INR	5.46
Platelet (n)	77000
D- Dimer	>10000
FDP (mcg/mL)	>20
Fibrinogen (mg/dL)	230

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The treatment of vasculitis syndrome of methamphetamines poisoning consists of corticosteroid therapy, immunosuppression, and plasmapheresis [13, 14]. However, it is better to focus on immunosuppression rather than corticosteroid therapy because of the adverse effects of the corticosteroids [15]. The reported case was managed by plasmapheresis and corticosteroids and the hemodialysis to treat the patient's condition.

4. Conclusion

Methamphetamine poisoning can affect several organs, including kidneys, central nervous system, and lungs, in addition to rhabdomyolysis, DIC, and TTP. Developing pseudo vasculitis is rare, but it can present in particular circumstances. Corticosteroids, immunosuppression, and plasmapheresis are effective in managing pseudo vasculitis caused by methamphetamines intoxication.

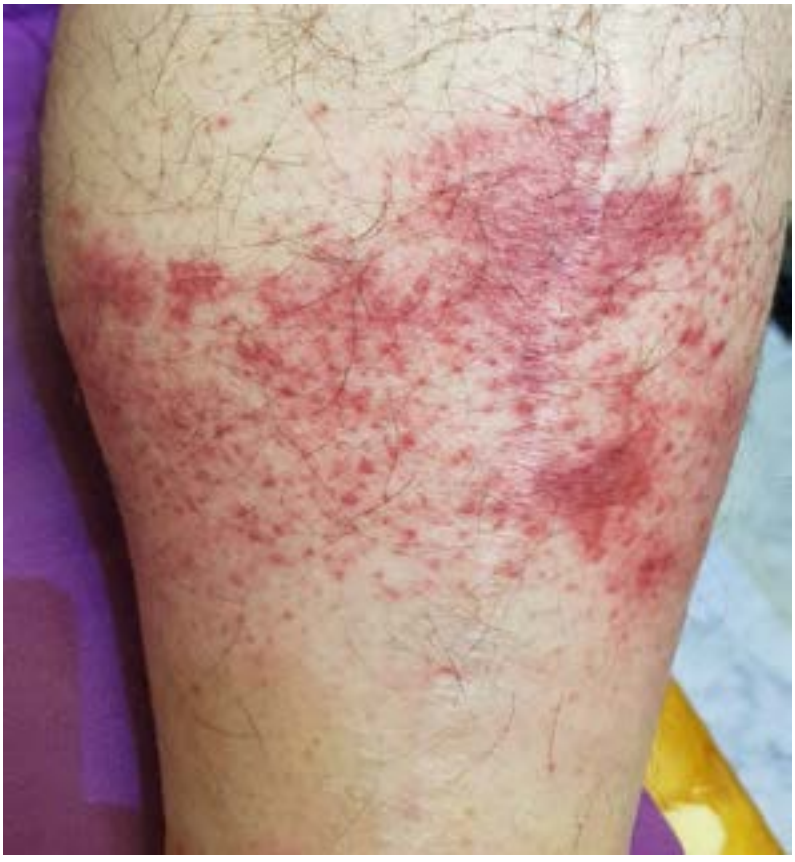

Figure 1. Petechiae manifestations on the skin of the patient's foot

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Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

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Author's contributions

All authors equally contributed to preparing this article.

Conflict of interest

The authors declared no conflict of interest.

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