Reversal of Isoniazid-Induced Status Epilepticus Following Pyridoxine

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ABSTRACT

Introduction: Intoxication caused by anti-tuberculosis drugs is a rare event in the modern era of medicine. However, high doses of isoniazid may cause convulsion, metabolic acidosis, lactic acidosis, rhabdomyolysis, coma, and eventually death.

Case Report: Sixteen-year-old female patient of foreign nationality with no history of systemic disease or drug use was admitted to the emergency department with decreased level of consciousness. Glasgow Coma Scale was 6; pupils were isochoric; and pupillary light reflexes were bilaterally equal. Metabolic acidosis with high anion gap was detected. Following this, a generalized tonic–clonic seizure occurred. These clinical signs and symptoms led to orotracheal intubation. Metabolic acidosis was treated using NaHCO₃. After 10 mg of intravenous diazepam injection, the seizure was stopped. However, three additional convulsions occurred and midazolam was intravenously administered. And finally intravenous pyridoxine (50 mg/kg/day) infusion was started. The patient gained consciousness after 30 minutes.

Conclusion: Isoniazid intoxication may be successfully treated with early intervention and the administration of pyridoxine, which is the sole treatment modality.

Keywords: Isoniazid intoxication, coma, pyridoxine

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Introduction

Intoxication cases caused by anti-tuberculosis drugs occur rarely. Isoniazid (INH) is an effective and economically advantageous drug option in the treatment and prophylaxis of tuberculosis (1). Isoniazid (true) inhibits glutamic acid decarboxylase activity, which is dependent on pyridoxal phosphatase and blocks the production of gamma amino butyric acid (GABA). Convulsions occur as a result of these processes (2). In addition, isoniazid reduces the amount of nicotinamide dinucleotide (NAD). Lactate dehydrogenase that converts lactate into pyruvate requires NAD as a cofactor, and decreased levels of NAD levels lead to lactate accumulation and acidosis, which further leads to lactic acidosis accompanied with convulsions in the patient (3).

High doses of INH are associated with metabolic acidosis, convulsions, rhabdomyolysis, lactic acidosis, coma, and even may cause death if not properly treated. The best treatment for INH intoxication-related convulsions is pyridoxine (vitamin B6) administration. Herein we present a case of a patient admitted to the emergency department after intractable seizures and metabolic acidosis with high anion caused by INH intoxication.

Case Report

A 16-year-old female patient of foreign origin weighing approximately 60 kg with no clinical history of systemic disease or drug use was admitted to the emergency department after decreased level of consciousness. Her relatives described that the event
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INH intoxication causes drug-resistant convulsions by decreasing GABA levels in central nervous system which leads to lower seizure threshold. Convulsions, specifically resistant to barbiturates, are treated more efficiently if antiepileptic drugs are administered together with pyridoxine (4). Therefore, we administered midazolam with pyridoxine.

Muscle contractions during convulsions may rarely lead to rhabdomyolysis, which may be lethal. Moreover, rhabdomyolysis may slow beta-hydroxy-butyric acid metabolism, thus contributing to metabolic acidosis (5). Studies have shown that INH intake over 2.4 grams is directly associated with CPK increase (4). In the present case, CPK levels were increased as a sign of rhabdomyolysis but renal functions were normal; thus, no emergent dialysis was indicated.

Conclusion

Tuberculosis is a still-active disease in our country. INH intoxication cases may occur and may cause death if not properly and urgently treated. Therefore, in emergency departments, the differential diagnosis should include INH intoxication in cases with convulsions with unknown origin and resistant to commonly used antiepileptic drugs, metabolic acidosis with high anion gap, and coma. The only specific antidote for treatment is pyridoxine administered parenterally in equal doses with INH intake.

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References