

The Right Strike: Diagnosing Alcoholic Ketoacidosis in ED

Abhishek Yadav¹, Sourabh Saini², Smriti Arora³, Kishalay Datta⁴

How to cite this article:

Abhishek Yadav, Sourabh Saini, Smriti Arora, Kishalay Datta, The Right Strike - Diagnosing Alcoholic Ketoacidosis in ED. *Ind J Emerg Med.* 2024;10(4):223-225.

Abstract

Alcoholic ketoacidosis is a severe metabolic disorder occurring in individuals with a history of binge alcohol intake. AKA diagnosis is challenging and often delayed, due to its close resemblance with DKA. AKA can turn fatal due to severe metabolic disturbances and electrolyte imbalance. In this case report, we discuss an old age female patient brought into the ED with symptoms of AKA, the challenges faced and the diagnosis and treatment in this patient.

Keywords: Alcoholic ketoacidosis (AKA), Diabetic ketoacidosis (DKA).

INTRODUCTION

Alcoholic ketoacidosis is a severe metabolic condition, generally seen in patients with a history of massive alcohol consumption. The diagnosis of AKA is often challenging, usually missed at times in the ED due to its resemblance with other metabolic disorders. The presentation is often parallel with DKA and thus, the mismanagement in these patients often leads to

increased morbidity and mortality in these patients. The patients with AKA present with varied systemic signs but have characteristic low blood pH (severe metabolic acidosis), raised anion gap and electrolyte imbalance. The prompt diagnosis and rapid correction of these abnormalities has shown to improve the overall patient outcome. Given the rise in alcohol-related health hazards, we aim to provide proper steps in diagnosis and treatment of this debilitating disease to our readers through this case study.

Author's Affiliation: ^{1,2}Resident, ³Senior Resident, ⁴HOD, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh, Delhi 110088, India.

Corresponding Author: Abhishek Yadav, Resident, Department of Emergency Medicine, Max Super Speciality Hospital, Shalimar Bagh, Delhi 110088, India.

E-mail: abhiyadav2794@gmail.com

Received on: 18-12-2023

Accepted on: 14-02-2024



CASE

A 45 year old wealthy female was brought into the ED with complaints of breathing difficulty associated with multiple episodes of vomiting and pain in the abdomen. During the initial assessment, the patient was looking lethargic with severe respiratory distress. She had a significant history of diabetes in the past. Her initial vitals were : heart rate - 124/minute, Blood pressure - 90/50 mmHg, respiratory rate - 22/minute, Spo2 - 90 % on room air; significantly increased to 98 % on 4 liter oxygen, random blood sugar - 244 mg/dL, temperature - 100°F. Her arterial blood gas analysis was : pH - 7.01, pCO₂ - 22, pO₂ - 64, bicarbonate - 8, Anion gap - 25. Urine ketone was done which was positive.

Her breathing pattern has changed during the initial 30 minutes of the ED evaluation, now compromising her airway. Owing to the metabolic acidosis and respiratory distress (compromised airway), after reviewing medical literature, the patient was planned for endotracheal intubation and mechanical ventilatory support (after taking informed consent from husband). Ventilatory settings were arranged, fluid correction with 1 dose of thiamine and electrolyte correction was started in the ED.

Her husband was enquired about the symptom onset and her relevant history. Based on the history provided by the husband, she was a chronic alcoholic individual and had gone to a “kitty party” for holi festival celebration, where she had a binge drink and developed these symptoms. She is a known diabetic and was not under any regular medication. Based on the history provided by the husband and the blood parameters, she was diagnosed to have alcoholic ketoacidosis.

She was started on medical management for alcoholic ketoacidosis with fluid resuscitation, daily dose of thiamine and after 2 days, she was weaned off, clinical psychologist consultation was done and after 5 days of hospitalization, she was discharged home in healthy condition.

Patient didn't turn up for post discharge follow-up.

DISCUSSION

Alcoholic ketoacidosis diagnosis is a challenging condition. The presentation of these patients, as supported by the presentation of our patient, is generally with severe metabolic acidosis with

presence of ketone bodies. It should be suspected in any patient who is having a chronic history of alcohol intake, binge alcohol episode and malnourishment.¹ The patients initially have non-specific symptoms like nausea, vomiting, abdominal pain, diarrhea but can later develop severe electrolyte imbalance, hypovolemia, due to diarrhea and vomiting.² Patients can land up into shock-like conditions due to volume depletion and electrolyte imbalance.³

The occurrence of metabolic acidosis in alcoholic patients is multifactorial Figure. Firstly, the production of ketone bodies occurs due to the inhibition of lipolysis (fats as energy source) by ethanol, thus in-turn, promotes acidosis. Secondly, metabolism of alcohol will release acetate as the end product, which in-turn is acidic. Thirdly, lactic acidosis due to dehydration as a result of tissue hypoperfusion can lead to acidosis.^{4,5}

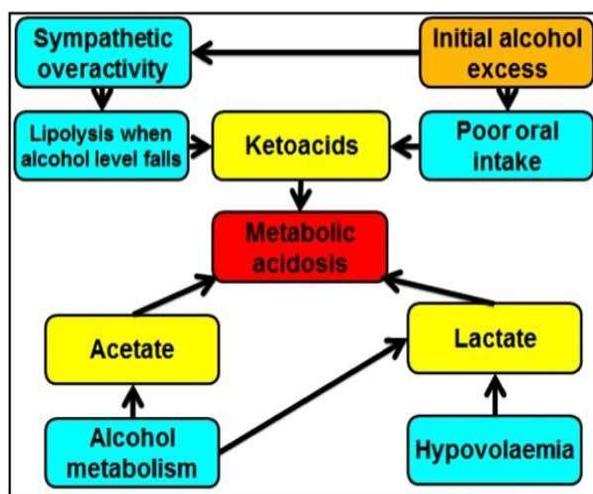


Fig. 1: Ref Oxf Med Case Reports. 2016 Mar; 2016(3) 31-33

The most possible alternative for AKA is DKA, but history of alcohol consumption, examination findings, abnormal electrolytes and severe metabolic acidosis plays a vital role in diagnosing AKA differentiating it from DKA.⁶ The table below suggests the differential between AKA and DKA.

The treatment in the management of AKA in the emergency department is aggressive fluid management. The fluid therapy helps in reducing the tissue hypoperfusion thus, removing the excess of lactic acid, acetate.⁷ This improves the acidosis status of the patient. Simultaneous correction of electrolyte imbalance and thiamine correction with proper diet has increased patient survival, preventing the morbidity and mortality in the patients with AKA.⁷

	AKA	DKA
Past medical history	Alcohol excess	Might be known diabetic or new presentation
Clinical presentation	Non-specific features	Non-specific features
Alertness	Alert and lucid usually	Variable but often decreased alertness
Examination	Dehydrated and clinically more well than expected	Dehydrated and clinically very unwell
Blood gas analysis	Metabolic acidosis with raised anion gap	Metabolic acidosis with raised anion gap
Blood glucose	Usually low or normal, can be modestly raised	Usually significantly raised
Ketones	Present on both urinary and blood test	Present on both urinary and blood test
Beta-hydroxybutyrate	Significantly raised	Mildly raised
Electrolyte abnormalities	Often low potassium, phosphate and magnesium	Total body potassium low (serum potassium is either low or normal)

CONCLUSION

AKA is a challenging condition often misdiagnosed in the initial presentation in the ED. It is often confused with DKA. Prompt history taking, history of alcohol intake, laboratory parameters suggestive of severe metabolic acidosis and high anion gap with electrolyte imbalance plays a definitive role in setting up the diagnosis of alcoholic ketoacidosis. Fluid therapy remains the mainstay in the treatment of AKA.

REFERENCES

1. Wrenn KD, Slovis CM, Minion GE, Rutkowski R. The syndrome of alcoholic ketoacidosis. *Am J Med* 1991;91:119.
2. Yanagawa Y, Sakamoto T, Okada Y. Six cases of sudden cardiac arrest in alcoholic ketoacidosis. *Intern Med* 2008;47:113-117.
3. Allison MG, McCurdy MT. Alcoholic metabolic emergencies. *Emerg Med Clin North Am* 2014;32:293-301.
4. Palmer JP. Alcoholic ketoacidosis: clinical and laboratory presentation, pathophysiology and treatment. *Clin Endocrinol Metab* 1983;12:381.
5. Halperin ML, Hammeke M, Josse RG, Jungas RL. Metabolic acidosis in the alcoholic: a pathophysiologic approach. *Metabolism* 1983;32:308.
6. Balasse EO, Féry F. Ketone body production and disposal: effects of fasting, diabetes, and exercise. *Diabetes Metab Rev* 1989;5:247.
7. McGuire LC, Cruickshank AM, Munro PT. Alcoholic ketoacidosis. *Emerg Med J* 2006;23:417-420.