



CASE REPORT

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Diabetic Ketoacidosis in a 39-Year-Old Female; A Case Report and Review of Literature

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Diabetic ketoacidosis (DKA) is a serious and potentially life-threatening complication of diabetes mellitus, characterized by hyperglycemia, ketonemia, and metabolic acidosis. This case report describes the clinical presentation, diagnostic evaluation, and management of a 45-year-old female with newly diagnosed type 2 diabetes who developed DKA. The aim is to highlight key aspects of DKA presentation, diagnostic criteria, and treatment strategies to improve early recognition and management.

Keywords: Diabetic Ketoacidosis; Type 2 Diabetes; Insulin Therapy; Fluid Resuscitation; Electrolyte Management; Clinical Case Report

INTRODUCTION

Diabetic ketoacidosis (DKA) is a condition that predominantly affects patients with type 1 diabetes but can also occur in individuals with type 2 diabetes, particularly during periods of severe insulin deficiency or stress. The pathophysiology involves a lack of insulin and an increase in counter-regulatory hormones, leading to hyperglycemia, ketosis, and metabolic acidosis. Early recognition and prompt treatment are crucial to prevent complications and improve outcomes. [1, 2].

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CASE REPORT

Case Presentation

A 45-year-old female presented to the emergency department with symptoms of nausea, vomiting, abdominal pain, and generalized weakness. Her medical history was significant for obesity and hypertension, but she had no previous diagnosis of diabetes. She reported a 2-week history of polyuria, polydipsia, and unintentional weight loss. On examination, she was lethargic, with a blood pressure of 110/70 mmHg, heart rate of 120 bpm, and a respiratory rate of 24 breaths per minute. Her physical examination revealed dry mucous membranes, a fruity odor on her breath, and abdominal tenderness without rebound or guarding.

Diagnostic Evaluation

Initial laboratory tests revealed:

- **Blood glucose:** 450 mg/dL (25.0 mmol/L)
- **Serum ketones:** Positive
- **Arterial blood gas:** pH 7.25, bicarbonate 12 mEq/L, anion gap 18 mEq/L
- **Serum electrolytes:** Sodium 135 mEq/L, potassium 4.0 mEq/L, chloride 105 mEq/L, creatinine 1.2 mg/dL

These findings were consistent with a diagnosis of DKA. Additional tests confirmed the presence of type 2 diabetes mellitus with an HbA1c level of 12.2%. [3].

Management

The patient was admitted to the intensive care unit for close monitoring and treatment. The management strategy included:

1. **Fluid Resuscitation:** Initial treatment involved intravenous (IV) fluid resuscitation with isotonic saline (0.9% NaCl) to address dehydration and restore intravascular volume. After the first few liters, the fluid was adjusted based on electrolyte levels and urine output. [4].
2. **Insulin Therapy:** A continuous IV infusion of insulin was started to reduce blood glucose levels and suppress ketogenesis. The insulin infusion was adjusted to achieve a blood glucose reduction rate of 50-75 mg/dL per hour. Subcutaneous insulin was considered once the patient's blood glucose approached 200 mg/dL and ketoacidosis was resolving. [5].
3. **Electrolyte Management:** Potassium levels were closely monitored due to the risk of hypokalemia with insulin therapy. Potassium replacement was administered as needed to maintain normal serum levels. [6].

4. **Acidosis Correction:** The patient's acidosis was monitored via arterial blood gases, and bicarbonate therapy was not used, as it is generally not recommended unless severe acidosis persists or there are specific indications. [7].
5. **Monitoring and Support:** Continuous cardiac monitoring was performed due to the risk of dysrhythmias related to electrolyte imbalances and acidosis. The patient received frequent monitoring of vital signs, blood glucose, ketones, and electrolytes. [8].

Outcome and Follow-Up

The patient's condition improved with the implemented treatment. Blood glucose levels normalized, ketonemia resolved, and the anion gap closed. The patient was transitioned to subcutaneous insulin and discharged with instructions for diabetes management, including blood glucose monitoring and dietary modifications. She was referred to an endocrinologist for ongoing management of her newly diagnosed type 2 diabetes. [9].

On follow-up, the patient reported adherence to her diabetes management plan, with improved glycemic control and no recurrence of DKA. She received education on recognizing symptoms of DKA and the importance of adhering to her treatment regimen. [10].

DISCUSSION

This case highlights several important aspects of DKA management:

1. **Diagnosis:** DKA should be suspected in patients with hyperglycemia, ketosis, and metabolic acidosis. The diagnosis is confirmed based on clinical presentation and laboratory findings. [11].
2. **Management:** Effective treatment of DKA involves a combination of fluid resuscitation, insulin therapy, and electrolyte management. Regular monitoring is essential to adjust treatment and avoid complications. [12].
3. **Prevention:** For patients with type 2 diabetes, especially those with poor glycemic control or those undergoing significant stress, preventive measures include patient education and regular monitoring to detect and manage early signs of DKA. [13].

CONCLUSION

Diabetic ketoacidosis is a severe complication of diabetes mellitus that requires prompt diagnosis and treatment. This case underscores the importance of early recognition and comprehensive management to prevent adverse outcomes. Healthcare providers should be vigilant in identifying at-risk patients and implementing appropriate treatment strategies to manage DKA effectively.

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