

Anesthesia Management of a case of intestinal perforation with Diabetic ketoacidosis

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Abstract

During anesthesia and surgery we often encounter patients with diabetes. Diabetic ketoacidosis is a common condition caused by the production of ketones due to lack of insulin. Its prevalence is high in diabetic patients. Elective surgery in DKA patients should be postponed. Patients with ketoacidosis have a higher mortality rate after surgery, and diabetes-associated hyperglycemia leads to longer hospital stays and a higher incidence of wound infections. In this case, we present the anesthesia method used in DKA patients undergoing exploratory laparotomy for peritonitis secondary to intestinal perforation.

Keywords: diabetes, ketones, intestinal perforation, DKA, Rapid sequence induction.

Introduction

Diabetes is spreading rapidly around the world^{1,2}. Diabetic ketoacidosis is a known complication of diabetes and requires urgent treatment. It often presents as acute abdomen, cellulitis, or diabetic foot requiring emergency surgery. It is a condition that requires the attention of treating physicians, as delays in treatment can lead to increased patient morbidity and mortality. Case reports highlight

management related to disease, anesthesia, and associated complications.

Case History

A 42-year-old male patient, a labourer by profession, of medium build, visited the emergency department complaining of the abdominal pain for 3days associated with vomiting and during further work-up and testing, he was diagnosed with gastrointestinal perforation and it was decided to admit the patient for exploratory laparotomy. Further history taking revealed that patient was a diagnosed case of diabetes mellitus and was taking oral hypoglycemic agents. He stopped taking the medication months ago when he started feeling mild abdominal discomfort which was relieved by taking medication from a local doctor. There was no history suggestive of hypertension/asthma/attack/or heart disease. On arrival at the operating room, the patient had sunken eyes and dry oral mucosa. The patient's heart rate was 120 beats/min and his blood pressure was 106/66 mmHg. His respiratory rate he was 28/min and oxygen saturation was his WNL. At ABG last night, his S. potassium was 3.45 mmol/L, HCO₃ was 17.2 mmol/L, and the anion gap was 22.2 mmol/L. When his blood sugar was measured with the strip method, it was 370

mg/dl. Urine was sent for urinary ketones, which was subsequently positive. X-ray film of in upright position showed air under the diaphragm. The patient was diagnosed as a case of gastrointestinal perforation with known diabetes mellitus and had features suggestive of diabetic ketoacidosis with abdominal sepsis foci as causative factors. Insulin was started as an infusion. Patient was premedicated with midazolam 1.5 mg and fentanyl 200 micrograms.

Rapid Sequence Induction was followed by cricoid compression with propofol 100 mg and succinylcholine 100 mg IV. An 8.0-mm endotracheal tube was inserted and was inflated after auscultation and confirmed with et CO₂. Patient was handed over to the surgeon for surgery. The surgery lasted for 1 hour and 45 minutes, during which a total of 4 liters of saline was infused, and blood glucose was continuously monitored with the aim of lowering it to no more than 75 mg per hour². I was. Supplemental potassium was administered at a rate of 20 meq per hour during the intraoperative period. Intraoperative urine volume of 50 ml and the intraoperative finding was perforated appendix with gangrenous cecum and ascending colon. The necrotic segment was removed with a right hemicolectomy, creating a distal ileostomy.

After regaining sufficient strength and consciousness, patient was extubated. Patients was treated with according to the GKI scheme at operating room and shifted to ICU. An ileostomy started to work and Ryle's tube was started. He was then extubated and sent back to Ward on POD20.

Discussion

Diabetes prevalence has increased steadily over the past decades. Anesthesiologists face challenges in perioperative management due to the increasing number of diabetic patients. Good perioperative glycemic control

is associated with better outcomes in terms of both mortality and morbidity. Diabetic ketoacidosis is less common in people with type II diabetes than in people with type I diabetes.

An emergency requiring immediate medical attention, with a mortality rate of up to 5%³. Diabetic ketoacidosis is caused by inappropriate insulin therapy and concomitant illness, with infections being the most common. Other factors include cerebrovascular accident, myocardial infarction. The American Diabetes Association defines DKA as

blood glucose > 250 mg/dl, plasma (HCO₃) < 18 mEq/L, plasma pH < 7.30, increased anion gap, and evidence of ketones in blood or urine⁴. Elevated blood sugar levels cause osmotic diuresis, and dehydration is almost universal. This can lead to volume deficits of up to 100 ml/kg⁴. Ketoacidosis is managed with hydration and insulin infusions, and frequent electrolyte and blood gas monitoring. Scheduled surgeries were to be postponed in patients with diabetic ketoacidosis. Because DKA patients often present with an acute abdomen, an appropriate radiological examination should be performed before deciding on laparotomy⁵. In most cases, acute abdomen symptoms resolve once the DKA begins to resolve. Rapid correction of blood glucose should be avoided and should not exceed 50-75 mg per hour, as a rapid drop in blood glucose may cause cerebral edema, further increasing mortality and morbidity should be Insulin administration also leads to low potassium levels⁶, so serum potassium should be monitored. The average deficiency of potassium is 3-5 mEq/kg⁷. If initial serum potassium is less than 3.3 meq/L, potassium should be replenished first, followed by insulin alone. In perforated peritonitis, laparotomy should be performed as soon as possible to close the perforation, so waiting for improvement in hyperglycemia or ketosis is not

recommended, so the patient was taken to surgery to initiate improvement parallel to surgery. to measure.

Conclusions

Diabetic ketoacidosis is not only a challenge for anesthesiologists when patients undergo emergency surgery, but also for physicians when dealing with emergencies. Controlling liquid electrolytes and blood sugar levels is key to success.

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