

The requirement of insulin and intravenous fluid in adult Diabetic ketoacidosis management: a review

Abstract

Background: Among the acute metabolic decompensation states of diabetes mellitus, diabetic Ketoacidosis (DKA) is relatively common. It commonly occurs in diabetic patients who have omitted insulin or had infection.¹ during the treatment of DKA, complications may arise and appropriate strategies to prevent these complications are required. This review aims to provide a brief overview of DKA to the clinical presentation with an in-depth focus on up to date therapeutic management.

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Objective

To review existing studies, to review the risk factors, DKA management in adults, focusing on intravenous fluid and insulin administration. It also includes potassium and bicarbonate replacement.

Data source

Literature review of relevant published literature from 2008-2018.

Data synthesis

The main causes or precipitants of DKA in patients are newly diagnosed diabetes, missed insulin doses in diagnosed diabetic patients and infections. The major underlying mechanism is insulin deficiency. Insulin doses were missed due to unaffordability of insulin or unavailability among poor people living in rural areas. Lack of knowledge was responsible for sick day management in all diabetic patients who developed DKA. In the times of sickness, when type 1 and type 2 patients will develop anorexia and vomiting, patients should frequently check their blood sugar levels and urine ketones. They should drink plenty of water. During this period and also at the time of surgery Insulin should not be stopped and doses should be adjusted to prevent diabetic Ketoacidosis. To correct dehydration, the preferred intravenous fluid is crystalloid over colloid.² and the hydration rates remain contentious. Most of the patients need 11 liters of fluid for correction of DKA. This correction takes a minimum of 48 hours. Maximum time needed is 7 days. In the management of DKA, most of the patients need 91-100 units of insulin¹ which should be given via syringe pump. During the first 24 hours of in-hospital treatment, each patient requires, on an average of 4.12 liters of intravenous fluid, 60 mol of potassium and 72 units of insulin.³ Bicarbonate should only be used in case of severe acidosis.⁴ Mortality is found to be 6% in developing worlds as treatment is usually carried out in general wards. Patients who present late, with severe acidosis have the poorest outcome. In the ICU setting, the mortality is 2-5%. Now it has come down to <1% in many centers.

Conclusion

Although mortality and morbidity from diabetic Ketoacidosis remain high in a low resource setting, improved health care systems and a reliable insulin supply can reverse the trend, to a large extent. Individuals and populations need empowerment through education, nutrition, and poverty eradication to improve self-care in health and living with diabetes. Early diagnosis and treatment with rehydration, insulin therapy and correction of electrolyte imbalance can be lifesaving. Precipitating event that gives rise to the DKA and sepsis should also be identified and treated.

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Conflict of interest

The authors declare that there is no conflict of interest.

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