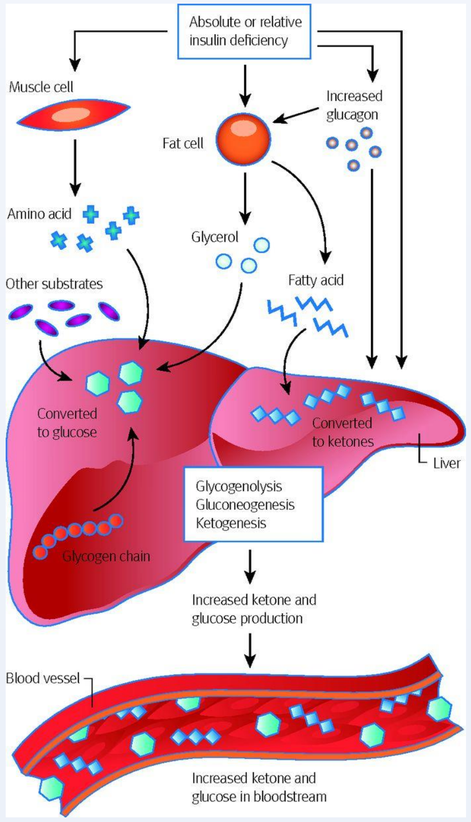
Catamenial DKA

Vasquez Espinosa, William MD. Yegneswaran, Balaji MD.

Saint Peters University Hospital – Internal Medicine Program

INTRODUCTION

DKA, a well know complication in patients with Type 1DM and DKA prone Type 2 DM, has nowadays a decreased mortality rate after the establishment of insulin use and appropriate regimens but remains being a common cause of hospitalization and readmission in many diabetic patients. DKA exacerbations occur in the setting of increased metabolic demands to the body and release of stress hormones. The imbalance of glucagon/insulin ratio thereafter generates a ketone prone state in the body secondary to gluconeogenesis, glycogenolysis and lipolysis that rapidly develops into acidosis. Although, much less common than medication noncompliance, infections or major illnesses, DKA secondary to menses has also been described.



CASE REPORT

A 29-year-old African American female with past medical history of Type 1 diabetes mellitus diagnosed at age 16, treated with basal and premeal insulin at home. She had four admissions to our hospital with diagnosis of DKA. The last 3 admissions happened in consecutive months almost on the same day. On the emergency department she usually presented with nausea, vomiting and abdominal pain. Her blood glucose levels during her admissions ranged from 246 to 400, her bicarbonate 11-20, pH between 7.22 -7.33, anion gap 15-23 with blood ketones; exams consistent with diagnosis of DKA. No clear precipitant factor was found on any hospital visit as she said being complaint with her insulin regimen and not having recent infection or other symptoms. Complementary exams to check for a possible precipitant which included CBC, BMP, UA, pregnancy test, chest Xray, viral panels and other imaging studies were always negative. Interestingly on all her admissions she was on her period. She ascertained having regular cycles and that her hospitalizations occurred on the second day of her menses.

Once diagnosed and admitted she received appropriate treatment, requiring an average of 1.7 days of ICU care with an average LOS of 2.7 days.

DISCUSSION

With the advent of insulin pumps and continuous glucose monitoring devices, variations in insulin requirements have been more evident throughout the menstrual cycle. There seems to be a relationship between the hormonal changes and insulin sensitivity. Studies have shown that insulin resistance peak on the luteal phase and that hyperglycemia and glycosuria may occur while women are menstruating. As such, DKA seems to be plausible in this setting. Our patient presenting with DKA to the hospital with no clear precipitant other than being in her menstrual period, will add to the current literature of the possibility of developing “Catamenial DKA”.

Of crucial importance is the fact that patients with catamenial DKA may have recurrent admissions happening even every month. This besides impairing the quality of life of our patients adds an economic burden to the healthcare system. It is necessary to educate physicians about this association, as it leaves room to act.

Patients may benefit of adjusting their insulin dose with the different phases of their menstrual cycle.

Additionally, with the shifting of medicine to a value cost healthcare model, reducing the number of readmissions is important for the physician and the hospital. A few questions while obtaining the history of the patient could save thousands of dollars. According with one study which reviewed the

National Inpatient Sample database for all hospitalizations with DKA, the average cost of hospitalization of DKA in 2014 was $26,566 per admission with average LOS of 3.24.

Further studies are required in this matter as insulin sensitivity appears to be variable in between individuals and there may be additional factors causing DKA in these patients.

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