

中文題目：SGLT2 抑制劑引起酮酸中毒

英文題目：SGLT2 inhibitor associated euglycemic diabetic ketoacidosis

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Introduction:

SGLT2 inhibitors are one of newest drugs and now widely used for treatment of type 2 diabetes (T2DM) by increasing urinary excretion of glucose and improve glycemic control, body weight and blood pressure. ¹However 2015 Food and Drug Administration (FDA) issued that warns of an increased risk of diabetic ketoacidosis (DKA) with uncharacteristically mild to moderate glucose elevations (euglycemic DKA [euDKA]) associated with the use of all the approved sodium–glucose cotransporter 2 (SGLT2) inhibitors. ¹

Case report:

A 30 years old single female patient without past medical history had diagnosed of diabetes during health exam in 2014. She received oral hypoglycemic agents, but poor controlled and then she visited to our hospital. Initially, her glycated hemoglobin (HbA1c) is 14.4% and Glucagon stimulation test showed C-peptide is 0.96 ng/ml and 2.09 ng/ml in 0min and 6min respectively (reference range 1.06-3.53 ng/ml). Then she received basal bolus insulin therapy. However, her blood sugar was not well controlled due to irregular diet control and miss insulin injection for the reason of travelling and stress for work.

In April, 2017, she presented to emergency department due to excessive vomiting for several times for one day. She had slight dull abdomen pain, fatigue and decrease appetite. She mentioned she used Dapagliflozin 10mg once daily for 1 day which was prescribed by other physician and then decrease insulin dose by herself. Her lab data showed blood glucose level of 215mg/dl, PH 7.004, bicarbonate 10mmol/L, blood beta-ketone 4.9mmol/L, serum sodium 137 mEq/L, potassium 4.6 mEq/L, chloride 110 mEq/L, creatinine 1.2 mg/dl (estimated GFR 53.1 mL/min by MDRD). We stopped Dapagliflozin and prescribed intravenous fluid hydration and intravenous insulin infusion. Because of diabetic ketoacidosis and suspicious of autoimmune diabetes, we checked insulin antibody and it reported insulin antibody 6.74 B/T (<5.5 B/T), Anti-IA2 1.172 U/mL (<1.0 U/mL), Anti-GAD-Ab 15.55U/mL (<1.0 U/mL). Glucagon stimulation test

History of DKA	-	+	+	-	-	-	-	+
Plasma glucose (mg/dl)	215	206	288	198	262	247	151	191
pH	7.004	7.217	7.39	7.168	7.215	6.968	7.0	7.12
Blood beta-ketone (mmol/L)	4.9	6.0	6.6	5.8	6.4	4.2	4.7	5.8
Anion gap	17	24	22	18	16	17	20.7	14.6
Bicarbonate (mmol/L)	10	7	8	9	9	3	4.1	6.5
Precipating factors	-Uncontrolled diet -Decrease insulin	-Infection (liver abscess)	-Noncompliance with insulin therapy	-Uncontrolled diet -Refuse insulin injection and only OHA	-Impaired medication and diet control	-Uncontrolled diet	-Uncontrolled diet -Acute pancreatitis related to hyperTG and alcohol	-Sleeplessness -Anxiety, Psychological stress

Discussion:

Because DKA is a potentially lethal complication, the consensus group recommend that potential triggering factors should be identified during the exposure period to SGLT-2 inhibitors, which include inter-current illness, reduced food and fluid intake, reduced insulin doses, and history of alcohol intake.^{2,3} Symptoms of DKA, including nausea, vomiting, abdominal pain, tiredness, and shortness of breath, should be monitored.⁴ One should be aware that patients with SGLT-2 inhibitors related DKA may not have very high blood glucose level, sometimes being called “euglycemic DKA”, and their plasma glucose level is usually < 300 mg/dL.⁴

Conclusion:

Adverse events rate of 3.3 cases of SGLT2 inhibitors associated DKA per 1,000 patient-years in our hospital. So this estimate is higher and double amount of adverse events in Asian patient for treating with SGLT2i than Western. So it must be treated with caution and temporary cessations of drugs during illness and surgery. So it is important for clinicians to identify those patients at risk to reduce further events. There was more estimated in Asian persons and so SGLT2i was whether related to genes and races or not , so need further studies and evaluation.

References:

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