

## Glucose/insulin-glargine/insulin-lispro

OS

**Hepatic glycogenosis, hypoglycaemia and acute hepatitis: case report**

A 16-year-old boy developed hepatic glycogenosis, hypoglycaemia and acute hepatitis following an overdose of insulin-glargine and insulin-lispro. Additionally, the treatment with glucose for hypoglycaemia had also attributed the hepatic glycogenosis.

The boy, who had a 7 year history of type 1 diabetes mellitus presented in the evening to an emergency department with abdominal discomfort, nonbilious nonbloody vomiting nausea and hypoglycaemia for the past 8 hours. His most recent glycated hemoglobin A1c level was 9.5%. The abdominal symptoms were initiated in the late afternoon on the day of presentation. His blood sugar was 40 mg/dL.

The boy started receiving oral glucose tablets [*dose not stated*]. A day earlier, he received his usual insulin doses. His regular medications included insulin-glargine [glargine insulin] each night, insulin lispro [lispro insulin] with meals [*routes and doses not stated*], sertraline, guanfacine and melatonin. He was alert, afebrile, with stable vital signs. Examination was significant for epigastric and right upper-quadrant tenderness. Laboratory examinations revealed elevated liver enzymes and hypoglycaemia. Blood test findings were normal. He was tested negative for infectious aetiology. Urinalysis was negative for ketones. He received juice for the hypoglycaemia. He was admitted in a hospital for monitoring. Overnight, he had further two hypoglycaemic episodes and was treated with juice. Twelve hours following the admission, repeat laboratory examinations revealed significant elevation in liver enzymes. He was tested negative for autoimmune hepatitis. An abdominal ultrasound revealed normal liver size and texture. His thyroid function was normal. Due to rapid rise in transaminase levels, he was empirically treated with acetylcysteine (N-acetylcysteine). His transaminase levels were normalised by 3 weeks. He was discharged after a prolonged hospitalisation. A medication overdose was suspected, but he denied it. He did not have hypoglycaemia during the admission. Two weeks later (30 days after the initial admission), he was admitted again with nausea, vomiting, abdominal pain and hypoglycaemia. In the morning of the admission, before breakfast, his blood sugar was 40 mg/dL (hypoglycaemia). He did not receive prandial insulin. He consumed servings of juice and more than 20 glucose tablets to maintain blood glucose above 70 mg/dL. During the day, he developed nausea and right-sided abdominal pain of 8/10 in intensity. By late afternoon the symptoms were worsened. He also had nonbilious, nonbloody emesis. Examination was unremarkable except for right upper-quadrant abdominal tenderness. Laboratory findings revealed increased liver enzymes and hypoglycaemia. Blood test findings were normal, basic metabolic profile was normal, negative for urine ketones and negative for COVID-19. At the time of hypoglycaemia, his total serum insulin level was 250 mU/L with a C-peptide of <0.1 ng/mL, consistent with excess exogenous insulin. Later, his serum glucose levels were improved. Consequently, fluids were weaned and then discontinued. Over 3 days, the abdominal pain and nausea subsided. His insulin regimen was re-initiated and he did not have further hypoglycaemic episodes. Repeat serum insulin level was 19.5 mU/L. Within 2 months, the liver enzymes were normalised. He was diagnosed with hepatic glycogenosis due to insulin overdose and repeated glucose administration to treat hypoglycaemia.