Factitious hypoglycemia may be difficult to diagnose clinically. Hypoglycemia due to insulin self-administration is established by the presence of a low c-peptide and elevated plasma insulin levels. Commercial insulin assays often fail to detect insulin analogues and can create confusion among providers investigating the cause of hypoglycemia.

A 20-year-old female with no significant past medical history presented to an Emergency Room (ER) with hypoglycemia. She was treated with a single dose of octreotide 150 mcg, dexamethasone 10 mg PO and started on a D10W drip at 100 ml/hr prior to transfer. Laboratory studies on transfer reported plasma glucose 52 mg/dL (RR: 70-100), low C-peptide 0.02 (RR: 0.78-5.19), low insulin level <0.087 uIU/mL, normal IGF-I level 122 ng/mL (RR: 85-370), normal IGF-II level 401 ng/mL (RR: 333-967), and low Pro-insulin level 1.8 pmol/L (RR: 3.6-22 pmol/L). Sulfonylurea Screen was negative.

The patient and her mother both denied exogenous insulin use. The patient and her mother both work in healthcare. The patient’s boyfriend has type 1 diabetes mellitus and the patient stated she keeps insulin in her purse for him. The patient was admitted for a 72 hour fast and remained normoglycemic.

An aliquot of the admission ER insulin blood sample was sent to second laboratory utilizing an assay able to detect analog insulins. The patient’s sample previously reporting an undetectable insulin level (<0.087 uIU/mL) now reported an insulin level 8 uIU/mL.

Factitious hypoglycemia is a challenging clinical diagnosis. The term factitious implies an attempt to deceive and creates mistrust between the physician and patient. However, hypoglycemia may be the result of medication errors or administered by a second party with the intent to harm. Analog insulins (glargine, aspart, lispro, glulisine, etc) are genetically modified insulins developed to mimic the physiologic pattern of pancreatic beta cell insulin secretion. The amino acid modifications in analog insulins result in structural variations which alters the ability of highly specific commercial automated immunoassays to accurately quantify these analog insulins. The variation in lab assay detection may cause confusion when interpreting the results. The DiaSorin Liaison XL platform in our hospital utilizes a chemiluminescence immunoassay which does not detect insulin analogues, but detects regular and NPH insulin as they are structurally identical to endogenous human insulin. The second laboratory uses the Siemens Advia Centaur platform, an immunoassay which reacts with insulin analogs “on a nearly equimolar basis with the analogs insulin aspart, insulin glargine, and insulin lispro. Insulin detemir exhibits approximately 50 percent cross-reactivity. Test reactivity with insulin glulisine is negligible (< 3 percent).”

Many commercial insulin assays do not detect analog insulins and none qualitatively distinguish between different insulins. Failure to recognize this detection flaw may result in misdiagnosis, patient safety issues and costly unneeded additional studies.