Continuous Glucose Monitoring Facilitates Diazoxide Use in the Management of Glut1 Deficiency Syndrome

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Background
- Glut1: glucose type 1 transporter, located in blood-brain barrier
- Glut1DS caused by mutations SLC2A1 (chromosome 1p34.2) that encodes Glut1
- Glut1 affected ♦ impaired glucose transport across blood-brain barrier ♦ ↓ CSF glucose ♦ ↓ glucose for brain ♦ drug-resistant metabolic epilepsy
- ~500 cases worldwide, 90% de novo
- Standard treatment: ketogenic diet (KD), alternative but not preferred energy source
- Diazoxide: ↓ insulin ↑ blood glucose ↑ intracerebral glucose ↓ seizure frequency
- Previous use of diazoxide complicated by hyperglycemia
- CGM: demonstrated benefit in diabetes, congenital hyperinsulinism
- Can CGM enable diazoxide use in KD-resistant Glut1DS?

Clinical Case
- 14 yo F w/ first sz at age 2
- Refractory to antiepileptics
- Developed lower extremity weakness at age 5
- CSF glucose 36 (usually < 60 in Glut1DS) when blood glucose 93
- CSF/blood glucose ratio 0.39 (usually < 0.40 in Glut1DS)
- Genetic testing: c.398_399delGCinsTT:p.Lys133Phe
- Unable to tolerate KD due to severe nausea, vomiting, abdominal pain, and hypertriglycerideremia
- Glucose tolerance test during EEG demonstrating seizures: insulin 104 when blood glucose 109

Conclusions
1. CGM: safe initiation and precise titration of diazoxide
2. Diazoxide addresses neuroglycopenia unlike KD ♦ a new standard of care for Glut1DS?
3. CGM valuable tool for other inborn errors of glucose transport and carb metabolism

Disclosure
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Timeline: CGM data is reported with average glucose ± SD and diazoxide dose is presented as total daily dose.

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Daily CGM reports: First day with CGM vs recent day with CGM.