

Interesting Cases

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Disclosure

- Speaker for Corcept, Novo nordisk, Lilly

Different causes of glucose dysfunction

- Hyperglycemia
- Hypoglycemia
- Hyperglycemia

Franky

- 32 yo male presenting with weight gain and fatigue over the past few months
- Recent T2DM diagnosis with A1c = 7.3 %
- No medications

As a specialist, what should you be thinking?

- | | |
|------------------------|--|
| • Poor dietary choices | • Polyendocrine Metabolic Ovarian Syndrome |
| • Stress | • Pheochromocytoma |
| • OSA | • Hypercortisolemia |
| • Caffeine | • Medication use (Statin/Steroid) |
| • Thyroid dysfunction | • Chemotherapy |
| • Pancreatic disease | |

What testing is appropriate at this time?

- Poor dietary choices
- Stress
- OSA
- Caffeine
- Medication use (Statin/Steroid)
- Polyendocrine Metabolic Ovarian Syndrome
- Pheochromocytoma
- Hypercortisolemia
- Chemotherapy
- Thyroid dysfunction
- Pancreatic disease

• What is the thyroid function?

- TSH = 14.6

Why is hypothyroidism causing Hyperglycemia?

- Changes blood flow to skeletal muscle
 - Changes absorption of glucose tissues can absorb
- Causes mitochondrial changes
 - How efficiently cells can "burn" glucose
- Direct changes to insulin resistance related to weight gain

What about hyperthyroid?

- Gluconeogenesis & Glycogenolysis in the liver
- Rapid glucose absorption in gut
- Rapid metabolism of insulin

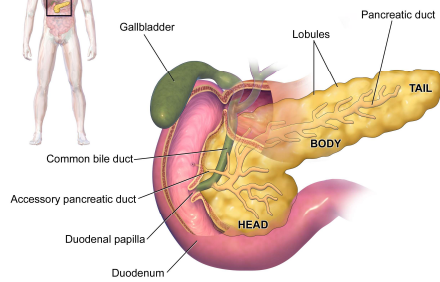
Treatment?

- Levothyroxine
-
- Methimazole
- Is it transient?

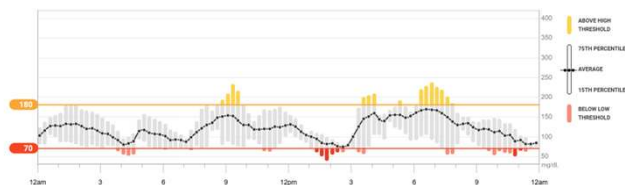
Mark

- 60 yo M referred for glucose control after resection of tail of pancreas
- Medication: Octreotide

What happens at the pancreases tail?



What do you need to know?



What is the definition of Hypoglycemia?

Whipple Triad

- Low glucose (<70)
- Symptoms of Hypoglycemia
- Immediate symptom resolution after glucose administration

Causes of Hypoglycemia

Exogenous

- Anti-Diabetic Medications
 - Insulin secretagogues / Insulin
- Alcohol-Induced
 - Blocking of gluconeogenesis = low fasting glucose
- Chemotherapy/Medications

Endogenous

- Insulinoma
- Nesidioblastosis

Fasting Lab Testing

- | | |
|----------------------------|-----------------------------|
| • C-peptide - ↑ | • C-peptide - nl |
| • Insulin level - ↑ | • Insulin level - nl |
| • Proinsulin level - ↑ | • Proinsulin level - nl |
| • Glucose levels – 40mg/dl | • Glucose levels – 72 mg/dl |
| • Sulfonylurea - neg | • Sulfonylurea - neg |

What is Octreotide?

- Somatostatin analogue
- Inhibits insulin and glucagon

Therapeutic options

- | | |
|---------------------------|------------------------------------|
| Insulinoma | Nesidioblastosis |
| • Surgery | • Low-carb/low-glycemic index food |
| • Diazoxide | • Acarbose |
| • Somatostatin analog | • Diazoxide |
| • Octreotide / Lanreotide | • Somatostatin analog |
| | • Distal pancreatectomy |

Mahealani

- 65 yo M diagnosed x 2012 w T2DM
- Poor diet
- Started on insulin x 2014
- Struggled with glucose control

Medical History

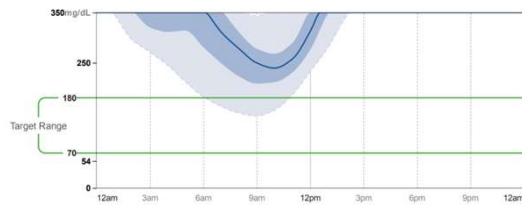
- HTN
- Dyslipidemia
- BMI 24

DM Medication

- CGM
- Tirzepatide 15 mg weekly
- Metformin 1gm BID
- Humulin U500
 - Breakfast – 160 units
 - Lunch – 160 units
 - Dinner – 130 units

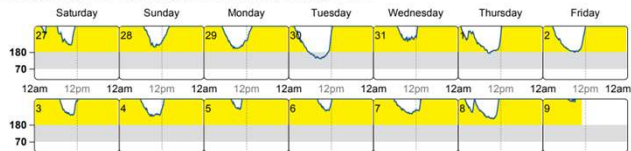
AMBULATORY GLUCOSE PROFILE (AGP)

AGP is a summary of glucose values from the report period, with median (50%) and other percentiles shown as if occurring in a single day.



DAILY GLUCOSE PROFILES

Each daily profile represents a midnight to midnight period with the date displayed in the upper left corner.



Source: Battelino, Tellez, et al. "Clinical Targets for Continuous Glucose Monitoring Data Interpretation: Recommendations From the International Consensus on Time in Range." Diabetes Care. American Diabetes Association. 7 June 2018. <https://doi.org/10.2337/dc18-0028>.

Why does his glucose not improve?

What are the different causes of Hyperglycemia?

- Not taking insulin
- Poor dietary choices
- Stress
- OSA
- Caffeine
- Polyendocrine Metabolic Ovarian Syndrome
- Pheochromocytoma
- Hypothyroid
- Hypercortisolemia
- Medication use (Statin/Steroid)

What test(s) should be done?

- Adjust/change medications
- Plasma metanephrines?
- Thyroid function studies?
- Sleep studies?

Labs

- Glucose 395 mg/dl
- C-peptide - ↑
- TSH 1.6
- GFR 37

Dexamethasone Suppression Test

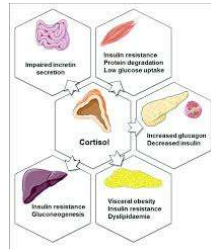
- Dexamethasone 517
- Cortisol 1.9
- CT Abdomen – No masses/adenomas

Diagnostic Criteria for Hypercortisolemia

- 24 hour UFC
- Salivary Cortisol
- Dexamethasone Suppression Testing

Hyperglycemia in Hypercortisolemia

- Stimulation of gluconeogenesis
- Inhibit glucose uptake
- Promotes Lipolysis



Neoplastic vs Non-neoplastic disease

- Non-neoplastic
 - Can the adenoma not be seen?
 - Is it from overstimulation of HPA axis?
 - Is Surgery an option?
- Neoplastic
 - Surgery?
 - Which side?

Therapeutic Management & Intervention

Etiological

- Surgical intervention

Pharmacological

- Adrenal steroidogenesis inhibitor
 - Ketoconazole
 - Levoketoconazole
 - Metyrapone
 - Osilodrostat
- Glucocorticoid receptor antagonist
 - Mifepristone

Question time.....