PREVENTING HYPOGLYCEMIA IN AN URBAN HOSPITAL

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Background

- Hypoglycemia during hospitalization is a well-recognized complication
  - Can occur even without a diagnosis of diabetes
  - Can increase length of stay
  - Can increase cost
  - Can increase risk of mortality
    - Both during admission and afterdischarge
- Hypoglycemia is CMS never event

Background, 2

- Hypoglycemia
  - Typical physiologic symptoms include
    - Tachycardia
    - Tremulousness
    - Sweating
  - Often symptoms are masked not present
    - Beta-blockers
  - Typical neurologic symptoms include
    - Confusion
    - Agitation
    - LOC
      - Can progress to coma

Background, 3

- Hypoglycemia unawareness
  - Loss of the warning adrenergic and cholinergic symptoms that previously allowed the patient to recognize developing hypoglycemia
    - Unaware patients do not take corrective actions
- Defective glucose counter-regulation
  - Epinephrine release attenuated
  - In the setting of absolute endogenous insulin depletion the body does not decrease insulin production with falling glucose levels
  - Failure to produce endogenous glucagon

Background, 4

- Hypoglycemia without diabetes
  - Drug induced
    - ACE inhibitors/ARBs
    - Ethanol
    - Beta blockers
    - Quinolones
    - Indomethacin
    - Quinine
    - Sulfonamides
  - Critical illness
    - Hepatic disease
    - Cardiac disease
    - Renal disease
    - Sepsis

History

- 2013: resident research project to identify causes of hypoglycemia (BS <70 mg/dL)
  - Small retrospective cross-sectional study (128 patients) looking at patients that received 50% dextrose or glucagon for hypoglycemia
  - 53 (41.4%) symptomatic
  - 45 (36%) of hypoglycemia at least 4 hours after last meal
  - 110 (85.9%) had diagnosed diabetes
    - 23 (21%) with po hypoglycemic agents
    - 91 (82.7%) in insulin

  Findings
  - 128 (72.2%) had some renal dysfx (GFR < 60)
    - 41 (32%) had ESRD on hemodialysis
  - 51 (59.4%) patients had > 2 episodes of hypoglycemia

Current

- Since that time we have continued to collect data
  - Continue to see glucagon and D50 use
    - About 10/month
      - Small percentage of accuchecks
- Standing order sets with correction dose insulin
  - Low, medium and high dose options
  - Nurse driven hypoglycemia protocol in place
- Nothing done looking at renal fx or hx of hypoglycemia

Possible solution

- At St Vincent Charity we have a falls program
  - Patients at risk identified during nursing assessment
  - Flagged
    - Yellow arm ban, yellow blanket, yellow socks, yellow magnet on doorframe
- What if we identified patients at risk for hypoglycemia?
  - Add question in nursing assessment about prior falls in the last month
  - Pull in lab data to assess for renal dysfunction
  - Can expand criteria to include other factors in the future or based on facility findings
    - Sulfonylurea
    - NPO status
    - etc

Possible solution, cont'd

- Once patient identified flag them
  - Arm band (candy stripe?)
  - Magnet
- Educate prescribers
  - Order low dose insulin correction
  - Permissive hyperglycemia
  - Bedtime snacks
  - More frequent accuchecks
  - Hold or lower doses of sulfonylureas
    - Possibly substitute GLP1 or correction dose insulin

Follow-up

- Continue to collect data
  - If hypoglycemia continues look for new reason and update program
  - Publish

Questions?