Ademoyo, Ca

Moussavi K, Nguyen LT, Hua H, Fitter S. Comparison of IV Insulin Dosing Strategies for 18 years old Authors

Previous studies with the insulin units. Baseline characteristics did not differ statistically between groups at Sodium. As expected, there was a greater K+ change, but it is uncertain this had any effect on the change in serum K+. There was no statistically significant difference in severe hypoglycemia (BG<40 mg/dl) between groups. There was 1 incidence of BG<40mg/dl in the 10 unit group compared to none in the 5 unit group. Ca2+ and sodium bicarb were mostly used in both groups while sodium zirconium cyclosilicate was higher in the 5 unit group due to a formulary change, but it is uncertain this had any effect on the change in serum K+.

Limitations include retrospective study, small sample size, single study center, and a formulary change. Hence, further studies are needed to fully assess the impact of both dosing strategies.

Discussion/ Limitation

- Baseline characteristics did not differ statistically between groups
- Hypoglycemia within 6 hours was not significantly different
- As expected, there was a greater K+ reduction in the 10 unit group compared to the 5 unit group, which was statistically significant
- There was no statistically significant difference in severe hypoglycemia (BG<40 mg/dl) between groups. There was 1 incidence of BG<40mg/dl in the 10 unit group compared to none in the 5 unit group.
- Ca2+ and sodium bicarb were mostly used in both groups while sodium zirconium cyclosilicate was higher in the 5 unit group due to a formulary change, but it is uncertain this had any effect on the change in serum K+. Limitations include retrospective study, small sample size, single study center, and a formulary change. Hence, further studies are needed to fully assess the impact of both dosing strategies.

Conclusion

- There was no statistically significant difference in the incidence of hypoglycemia between the 2 groups, possibly because the study was underpowered.
- There was a statistically significant difference in potassium reduction in the 10 units compared to the 5 unit group.

Results

- Hyperkalemia treatments used in the ED
  - Calcium: 3, Albuterol: 1, Furosemide: 2, Sodium zirconium cyclosilicate: 6, Sodium bicarb: 0, Sodium polystyrene sulfate: 0, Dialysis: 0

Endpoints

- Primary:
  - Incidence of hypoglycemia (BG < 70 mg/dl) within 6 hours of insulin administration

- Secondary:
  - Change in serum K+ after insulin therapy within 6 hours
  - Incidence of severe hypoglycemia (BG < 40 mg/dl) within 12 hours
  - Length of hospital stay (LOS)
  - In-patient mortality

Hyperglycemia BG < 70mg/dl

Primary: Incidence of hypoglycemia (BG < 70 mg/dl) within 6 hours of insulin administration

Secondary: Change in serum K+ after insulin therapy within 6 hours

P = 0.969

In-patient mortality

In-patient mortality

Change in serum potassium

Change in serum K+
P = 0.011

Change in serum K+
P = 0.011

Insulin dose

Insulin dose

Number of patients

Number of patients

P = 0.969

P = 0.011

Insulin dose

Insulin dose

5 units

5 units

10 units

10 units

Disclosures

- Authors have no conflicts of interests regarding personal or financial relationships with commercial entities that may have influenced the content or subject matter of this presentation. (Ademoyo.yetunde@mhsil.com)

References


Method

- IRB–approved, single center, retrospective study at Memorial Medical Center, a 500-bed teaching hospital
- Study period: January 2015 to September 2020

Inclusion Criteria

- > 18 years old
- Serum K+ > 5mmol/L
- Utilization of ED hyperkalemia protocol
- 5 vs 10 units of IV regular insulin received in the ED
- Blood glucose (BG) within 12 hours post insulin administration

Exclusion Criteria

- Pregnancy
- Absence of baseline serum K+
- Absence of baseline BG and within 12 hours after IV insulin dose
- Baseline BG < 70 mg/dl
- Failure to administer concurrent dextrose with insulin therapy
- Additional insulin before rechecking BG or serum K+ concentrations

Purpose

- This study will evaluate the incidence of hypoglycemia with 5 units of regular insulin compared to 10 units of regular insulin for the treatment of hyperkalemia in ED patients.

Background

- In the Emergency Department (ED), acute hyperkalemia is managed with a combination of membrane stabilizing, potassium shifting and potassium binding agents.
- The 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care recommends 10 units of IV regular insulin for the treatment of acute hyperkalemia together with 25g of dextrose.
- Previous studies have shown that reduced doses of insulin may have an equivalent or lower incidence of hypoglycemia compared to 10 units of insulin.
- In 2018, the ED hyperkalemia order set for Memorial Medical Center was updated to 5 units IV regular insulin as the default dose to reduce the incidence of hypoglycemia.

Inclusion Criteria

- > 18 years old
- Serum K+ > 5mmol/L
- Utilization of ED hyperkalemia protocol
- 5 vs 10 units of IV regular insulin received in the ED
- Blood glucose (BG) within 12 hours post insulin administration

Exclusion Criteria

- Pregnancy
- Absence of baseline serum K+
- Absence of baseline BG and within 12 hours after IV insulin dose
- Baseline BG < 70 mg/dl
- Failure to administer concurrent dextrose with insulin therapy
- Additional insulin before rechecking BG or serum K+ concentrations

Authors have no conflicts of interests regarding personal or financial relationships with commercial entities that may have influenced the content or subject matter of this presentation. (Ademoyo.yetunde@mhsil.com)

Discussion/ Limitation

- Baseline characteristics did not differ statistically between groups
- Hypoglycemia within 6 hours was not significantly different
- As expected, there was a greater K+ reduction in the 10 unit group compared to the 5 unit group, which was statistically significant
- There was no statistically significant difference in severe hypoglycemia (BG<40 mg/dl) between groups. There was 1 incidence of BG<40mg/dl in the 10 unit group compared to none in the 5 unit group.
- Ca2+ and sodium bicarb were mostly used in both groups while sodium zirconium cyclosilicate was higher in the 5 unit group due to a formulary change, but it is uncertain this had any effect on the change in serum K+.

Limitations include retrospective study, small sample size, single study center, and a formulary change. Hence, further studies are needed to fully assess the impact of both dosing strategies.

Conclusion

- There was no statistically significant difference in the incidence of hypoglycemia between the 2 groups, possibly because the study was underpowered.
- There was a statistically significant difference in potassium reduction in the 10 units compared to the 5 unit group.