Hyperglycemia Management in ICU Setting in Patients Undergoing Coronary Artery Bypass Graft Surgery

Authors

Jasjeet S Wasir¹, Ambrish Mithal¹, Paras Agarwal¹,
Chhavi Kohli¹, Surender¹, Navneet Wadhwa²

¹ Medanta, The Medicity, Division of Diabetes & Endocrinology, Gurgaon. P-0575; Stream: Basic and Clinical Science; Topic: Comorbidities
² AUW Global, Delhi, India.

Background

In a large institution like Medanta, hyperglycemia is commonly observed and an important determinant of outcome in patients undergoing coronary artery bypass surgery (CABG).

An easy to implement and follow, protocol based approach for control of hyperglycemia is necessary to improve the standard of care and hence better CABG outcomes.

Aim

We evaluated the already published protocol for (Medanta) In-Hospital management of Hyperglycemia at our tertiary care centre in patients undergoing CABG.

Method

We conducted an observational program Medanta CABG Glycemic management registry, which included 718 patients till June 2017.

Effective control of hyperglycemia was analysed and compared from Day 1 of ICU stay to Day 2 and also change in Glycemic control in ICU was evaluated.

Results

- Mean age: 62.8 years, average ICU stay: 4.5 Days.
- Mean HbA1c was 7.2%
- Overall change in the mean blood glucose in ICU on Day 1 Vs Day 2 was -26.01 ± 1.221 mg/dl (mean day 1 = 179.2 Vs mean day 2 = 153.2; 95% CI -28.4 to -23.61 ; <0.0001).
- Patients were clustered into two groups. Group 1 (n=28) with low risk profile included patients without diabetes, with ICU stay less than 5 days and with no-significant rise in serum creatinine and Group 2 (n=25) included patients with high risk profile: diabetics, ICU stay more than 5 days with significant rise in the creatinine levels (>0.3 mg/dl).
- The mean change in the blood glucose for ICU glycemic control for Group 1 on day 1 Vs day 2 was -11.1 mg/dl ± 1.07 (mean day 1 = 179 Vs mean day 2 = 167; 95% CI -13.25 to -8.94 ; <0.0001).
- The mean change in the blood glucose for ICU glycemic control for Group 2 on day 1 Vs day 2 was 5.93 mg/dl ± 1.07 (mean day 1 = 153 Vs mean day 2 = 158; 95% CI 1.337 to 10.53 ; <0.0001).
- The glycemic change in diabetics with less than 10 years of diabetes (n=554) was compared with duration more than 10 years (n=169).
- The mean change in the blood glucose for ICU glycemic control for less than 10 years on day 1 Vs day 2 was -26.45 ± 1.197 (mean day 1 = 178.1 Vs mean day 2 = 151.6; 95% CI -28.8 to -24.1 ; <0.0001).
- The mean change in the blood glucose for ICU glycemic control for diabetics less than 10 years on day 1 Vs day 2 was -26.45 ± 1.197 (mean day 1 = 178.1 Vs mean day 2 = 151.6; 95% CI -28.8 to -24.1 ; <0.0001).

Bibliography

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LATE BREAKING

- The mean change in the blood glucose for ICU glycemic control for diabetics more than 10 years on day 1 Vs day 2 was -24.55 ± 3.36 (mean day 1 = 182.8 Vs mean day 2 = 158.3; 95% CI -31.16 to -17.94 ; <0.0001)

Fig 1. Blood Glucose ICU Day 1 and Day 2

Fig 2. Blood Glucose ICU Day 1 and Day 2: Low risk Vs High Risk

Fig 3. Blood Glucose ICU Day 1 and Day 2: Diabetes Duration <10 years Vs Duration >10 years

Discussion

- Our stringent data auditing of the protocol based approach with the clustered based risk stratification reveals that the protocol based approach is useful for the management of hyperglycemia in ICU setting, which could be a standard of care approach.
- Our Medanta protocol is a standardised tool for our institutional set up for an effective control of hyperglycemia when compared from day 1 ICU to day 2 change in glycemia in ICU setting.
- The improved glycemic parameters on day 2 ICU admission across various sub-groups is encouraging and important to reduce the hospitalisation costs with possible improved clinical outcomes.

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Jasjeet Wasir E: drjasjeet@gmail.com