

Optimal Blood Glucose Monitoring Interval for Insulin Infusion in Critically Ill Non-Cardiothoracic Patients: A Pilot Study

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ABSTRACT

Objective: The American Diabetes Association and the Society of Critical Care Medicine recommend monitoring blood glucose (BG) every 1-2 hours in patients receiving insulin infusion to guide titration of insulin infusion to maintain serum glucose in the target range; however, this is based on weak evidence. We evaluated the compliance of hourly BG monitoring and relation of less frequent BG monitoring to glycemic status.

Materials and Methods: Retrospective chart review performed on 56 consecutive adult patients who received intravenous insulin infusion for persistent hyperglycemia in the ICU at Saint Vincent Hospital, a tertiary care community hospital in an urban setting in Northeast region of USA. The frequency of fingerstick blood glucose (FSBG) readings was reviewed for compliance with hourly FSBG monitoring per protocol and the impact of FSBG testing at different time intervals on the glycemic status. Depending on time interval of FSBG monitoring, the data was divided into three groups: Group A (<90 min), Group B (91-179 min) and Group C (≥ 180 min). Results: The mean age was 69 years (48% were males), 77% patients had preexisting type 2 diabetes mellitus (T2DM). The mean MPM II score was 41. Of the 1411 readings for BG monitoring on insulin infusion, 467 (33%) were in group A, 806 (57%) in group B and 138 (10%) in group C; hourly BG monitoring compliance was 12.6%. The overall glycemic status was similar among all groups. There were 14 (0.99%) hypoglycemic episodes observed. The rate of hypoglycemic episodes was similar in all three groups ($p=0.55$).

Conclusion: In patients requiring insulin infusion for sustained hyperglycemia in ICU, the risk of hypoglycemic episodes was not significantly different with less frequent BG monitoring. The compliance to hourly blood glucose monitoring and ICU was variable, and hypoglycemic episodes were similar across the groups despite the variation in monitoring. Significance of the Study: The importance of glycemic control in ICU has been well established and it is a resource intensive venture. However, there are no major studies highlighting the most optimal time interval for blood glucose checks in critically ill patients on insulin infusion. With this study we hypothesize that time duration between blood glucose checks can be increased safely without any untoward effects. Our study provides evidence for effective resource management with reducing the time spent with every glucose check and directly translating into high value care.

BIOGRAPHY

Dr. Nurul Haque, MD is an Internal Medicine Specialist in Dayton, OH and has over 16 years of experience in the medical field. He graduated from Aligarh Muslim University / J.L.N. Medical College medical school in 2005. He is affiliated with Merit Health River Region. He works in Vicksburg, MS and specializes in Internal Medicine.

49th Global Congress on Nursing Care and Research, Webinar | November 25, 2021

MD, Internal Therapist, Dayton OH, Miami, Florida

Citation: Nurul Haque., Optimal Blood Glucose Monitoring Interval for Insulin Infusion in Critically Ill Non-Cardiothoracic Patients: A Pilot Study, Nursing Care 2021, 49th Global Congress on Nursing Care and Research, Webinar, 25-11-2021, 02