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Reference Article: Driver, Brian E., Travis D. Olives, Johanna E. Bischof, Marcus R. Salmen, and James R. Miner. "Discharge Glucose Is Not Associated With Short-Term Adverse Outcomes in Emergency Department Patients with Moderate to Severe Hyperglycemia." *Annals of Emergency Medicine* 68.6 (2016): 697-705. Print.

PICO Question: Regardless of management, for hyperglycemic diabetic patients discharged from the ED, does the arbitrary lowering of BG to a set threshold (such as 350) reduce 7-day adverse outcomes?

Introduction: Diabetic patients commonly present to the emergency department. Many times, they are found to be appropriate for discharge, but providers are hesitant to do so without treating hyperglycemia, should significant hyperglycemia be discovered. There has been no real protocol or standard about how and when to treat this lab abnormality. This study aimed to discover if at 7-days there was any adverse outcome for not treating the patient.

Methods: This retrospective study was conducted via chart review of patients presenting to a busy, urban ED with ~100K patients per year. Patients were selected for glucose of >400 at the time of discharge and were excluded if they were admitted to the hospital, had type I DM, or presented with chief complaint of hypoglycemia. Arrival and discharge glucose levels were recorded, and diagnostics, treatment, length of stay, and iatrogenic hypoglycemia were accounted. The primary outcome was any repeat visit within seven days for DKA, HHS, symptoms of hyperglycemia, or hospitalization for any reason.

Results: 566 patients qualified for analysis with an arrival glucose of >400. 71 were lost to follow-up, and thus 495 encounters were analyzed. Mean arrival BG was 491, and mean discharge BG was 334, with dc glucose ranging between 351 and 694. In 60% of encounters, an average of 2.1 L of NS was given, and an average of 12.2 U subq insulin was given. 87% of patients had no adverse outcome as described above. 9% had a return visit for signs/symptoms of hyperglycemia, 4% were hospitalized for any reason, and only 2 encounters presented in DKA. HHS was not overserved. 9 encounters saw iatrogenic hypoglycemia as a result.

Discussion: There appears to be no statistically significant association between discharge glucose level and 7-day outcome. There was a wide range in discharge glucose, but despite this, the rate of adverse outcomes remained low, implying no causality from BG. DKA was very rare, which also supports that DM Type II's don't usually have this complication anyway. HHS was not observed at all, which makes sense as it is even more rare than DKA. ED interventions optimizing outpatient control, such as ensuring adequate follow-up, medications, supplies, and understanding of how to manage the disease, appear to be more appropriate than the acute lowering of BG.

Limitations: The researchers were not able to tell if patients presented to a different hospital within 7 days, which could obviously skew data. If a BG was determined to be "high" at any point, it was assumed the glucose was 600, even though it may have been much higher in reality. ED physicians were not controlled for reasons why they treated hyperglycemia. Many could have treated just because the patient was deemed "high risk" rather than the proposed reasoning of "fixing a number." Finally, this study is only applicable to patients discharged. Hospitalized patients represent an entire different population.

Bottom Line: For diabetic patients with hyperglycemia, efforts to reduce glucose level during the ED visit itself appear to lack value, suggesting that management should instead focus on longer-term diabetic management.
