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Title **Control of critical-illness hyperglycemia does not result in a unique lipid profile or a mortality benefit.**

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Introduction: Derangement of the lipid profiles of critically ill patients has been described. Previous trials have shown that the degree of derangement is associated with increased mortality in this group. Insulin therapy may improve and even normalize the lipid profiles in the critically ill, possibly leading to improved outcomes.

Hypothesis: Lipid profiles and 90-day mortality of patients in 2 groups of well-defined blood glucose ranges maintained by insulin infusion will be uniquely different.

Methods:A total of 103 patients who were a subset of the 120 patients enrolled in the Mayo Clinic NICE-SUGAR cohort that elected to have daily lipid profiles determined. Patients were randomized to one of two groups: targeted serum glucose levels of 81-108 mg/dl and 144-180 mg/dl, termed intensive insulin therapy (IIT) and conventional insulin therapy (CIT), respectively. Daily lipid profiles were determined daily for 6 days, and in hospital and 90 day mortality were recorded.

Results: Patient numbers were equally distributed between the two groups (CIT n=49, IIT n= 54) and there was no significant difference in patient demographics. Mean APACHE II scores were increased similarly in both groups: CIT 26.89, IIT 25.76, p NS. Patients in the IIT group received an average of 34.4 units of insulin per day, which was significantly greater than the CIT group (mean 19.8 units/day, p = 0.0019). Either parenteral or enteral nutrition was provided during the admission for 77% of the patients in both groups (CIT n=41, IIT n=42). Steroids were administered to patients in both groups (n=26 and n=32, CIT and IIT groups respectively), but this difference did not reach statistical significance. Baseline total cholesterol, HDL, LDL, and triglycerides did not differ significantly between the groups. Analysis of daily values of the lipid profile constituents failed to show further difference up to day six of randomization. Of note, the number of total patients having lipid profiles determined did drop daily and by day six the proportion of IIT group patients having recorded lipid profiles was higher, but not of statistical difference (p = 0.083). Mortality did not differ between the groups when analyzed during the hospital admission or at follow-up on day 90 (p = 0.28 and 0.38 respectively).

Conclusions: Control of critical illness hyperglycemia by either IIT or CIT regimen does not result in a unique lipid profile or 90-day mortality difference.

Case Reports: