Intravenous insulin administration is associated with an increased risk of ICU and hospital mortality, after correction for potential confounders” van Steen et al (2019).

Abstract:

Background: We assessed the association of intravenous insulin and glucose infusion with intensive care unit (ICU) and hospital mortality.

Methods: For this retrospective association study, we used data from all patients admitted to a medical-surgical ICU between January 2012 and September 2017. We excluded patients admitted < 24 h, patients with a diabetic ketoacidosis, patients with a therapy restriction upon ICU admission and readmissions. Using multivariate logistic regression, we examined the relation between intravenous insulin and glucose infusion and ICU and hospital mortality for all patients. Additionally, we used the same model to analyze the outcomes for patients admitted > 72 h.

Results: Of 9507 eligible patients, 3966 were included. After correction for potential confounders, intravenous insulin was associated with ICU and hospital mortality in patients admitted > 24 h (n = 3966) (odds ratio (OR) 1.09 [95% CI 1.05-1.13] and 1.09 [95% CI 1.06-1.13] per 0.1 IU/kg added, respectively). Likewise, intravenous glucose was associated with ICU mortality (OR 1.01 [95% CI 1.00-1.01]) but not with hospital mortality and (OR 1.00 [95% CI 1.00-1.01]) per g/day added, respectively. In patients admitted > 72 h (n = 1550),
insulin dose was associated with both ICU and hospital mortality ($p = 0.002$ and $p < 0.001$, respectively), but glucose infusion was not ($p = 0.08$ and $p = 0.2$, respectively). Conclusions: Intravenous insulin administration is associated with an increased risk of ICU and hospital mortality, after correction for potential confounders. Parenteral glucose administration was limited in amount but was still associated with ICU mortality. However, based on these results, it is unknown whether this association is an epiphenomenon, or represents a true harm of insulin and glucose administration.

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https://doi.org/10.1186/s13613-019-0507-x