

Observation of the Incretin Effect in Critically Ill patients

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Objective:

The impact of endogenous insulin secretion and its interaction with type of feeding (enteral-EN or parenteral-PN) in glycemic control protocols is unknown. This study examines whether there is any evidence for an EN-driven incretin effect.

Method:

Model-based insulin sensitivity (S_I) was identified for 52 patients on the SPRINT glycemic control during transitions off EN (ON/OFF), and back on to EN (OFF/ON). There was a minimum 10 hours before ON/OFF, 7 hours with EN off, and 5+ hours after OFF/ON. Increased modeled S_I after the OFF/ON transition, or decreased S_I after ON/OFF implies an incretin effect. Patients with diagnosed diabetes were not included.

Result:

Patients exhibited a -36% (IQR -82% to 24% $p=0.05$) reduction after the ON/OFF transition, and a median 32% (IQR -5% to 53%, $p=0.001$) maximum rise in measured S_I after the OFF/ON transition. Blood glucose was stable during the transitions with median shifts of -2% and -3% after the ON/OFF, and OFF/ON boundaries, respectively. However, 32% of patients exhibited increased S_I at the OFF/ON boundary and 37% exhibited reduced S_I at the ON/OFF boundary. The latter results are likely due to changes in patient condition over the 5-8 hours considered outweighing this effect.

Conclusion:

The results show that a majority of patients exhibited results indicating the existence of an incretin effect. The impact was stronger for the OFF/ON transition indicating that this effect may be blunted by long-term continuous EN infusions. These results provide the data to design conclusive studies, as well as to inform glycemic control protocol development.