

POSTER PRESENTATION

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# Personalised glucose therapy: glucose targets in critically ill patients with pre-existing poorly controlled type 2 diabetes

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## Introduction

In patients without pre-existing diabetes, hyperglycaemia during critical illness is associated with adverse outcomes. However, recent observational data suggest that in patients with pre-existing poorly controlled type 2 diabetes (defined as an HbA1c  $\geq 7\%$ ) prior to their acute illness, targeting glucose concentrations  $< 10\text{mmol/l}$  is associated with harm [1]. Accordingly a higher glucose target may benefit these patients.

## Objectives

To determine whether more liberal glucose targets in critically ill patients with pre-existing poorly controlled type 2 diabetes increases time weighted mean glucose concentration, attenuates hypoglycaemia, and appears overtly safe.

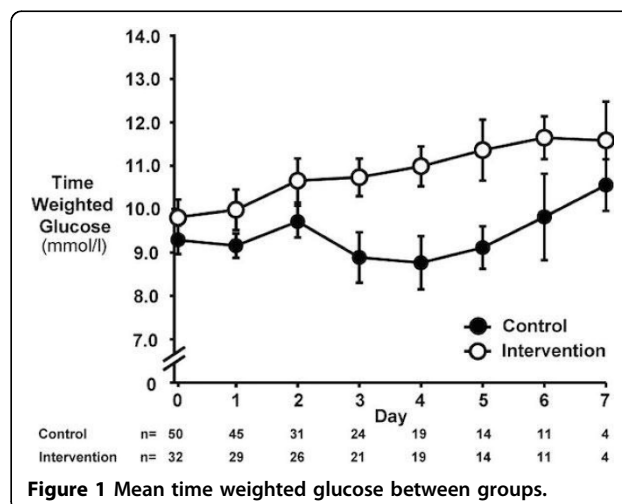
## Methods

Prospective, open-label, sequential period, pilot study of 86 patients with poorly controlled type 2 diabetes (admission HbA1c  $\geq 7.0\%$ ) and a blood glucose concentration  $> 10\text{mmol/L}$  requiring admission to the Intensive Care Unit (ICU) and administration of insulin. The 'control' patients ( $n = 53$ ) were consecutively admitted during a 6 month period and the 'intervention' patients ( $n = 33$ ) were admitted during a subsequent 6 month period. During the 'control' period blood glucose was targeted between 6-10mmol/l, whereas during the 'intervention' period the target was 10-14mmol/l. Time weighted mean glucose was calculated and recorded blood glucose concentrations  $< 4.0\text{mmol/l}$  considered as an hypoglycaemic episode for each patient. Data are mean (SE) or median [IQR] and

analysed using independent samples t-test, Mann-Whitney test, Chi-squared test, Linear and Logistic regression as appropriate.

## Results

The groups were well matched in terms of age (Control: 64.0 (2.0) vs Intervention: 62.6 (2.0) years), admission HbA1c (8.5 (0.2) vs 8.8 (0.2)%), APACHE II score (20.4 (1.0) vs 20.5 (1.2)) and Charlson Comorbidity Index (4.5 (0.3) vs 4.3 (0.3)). More liberal targets resulted in greater time weighted mean glucose concentrations (TWGlucose<sub>day0-7</sub> 9.3 (0.3) vs 10.2 (0.4) mmol/l,  $P = 0.04$ ) and there was a trend towards fewer patients with hypoglycaemic episodes (34% vs 16% of patients,  $P = 0.07$ ). There was no difference in ICU mortality (10 [19%] vs 6 [18%],  $P = 0.94$ ) or 90-day mortality (19 [36%] vs 12



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[36%],  $P = 0.96$ ). ICU length of stay was shorter in the 'control' period (3.5 [4.0] vs 6.3 [8.7] days,  $P = 0.01$ ) with significance persisting when adjusting for APACHE scores and Charlson Comorbidity Index ( $P = 0.04$ ).

### Conclusions

In critically ill patients with pre-existing poorly controlled type 2 diabetes, more liberal glucose targets increase mean glucose concentrations may reduce the incidence of insulin-induced hypoglycaemia, and appear to be overtly safe. Prospective studies using larger cohorts are indicated.

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