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COMMENTARY

A dead heat: target normal glucose levels in the intensive care unit—but with caution

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Abbreviation
ICU intensive care unit

It is remarkable that there is still more to be said regarding the management of hyperglycaemia in the intensive care setting after dozens of reviews, debates and editorials. Nevertheless, Dr Van den Berghe [1] and Dr Miles and colleagues [2] have provided concise and important viewpoints on this topic. Both are worthy of careful study as a guide to individual and institutional soul-searching regarding the implementation of guidelines on inpatient management of hyperglycaemia [3, 4].

Reality in medicine is not established solely on the basis of data, but also by perspective and interpretation. The positions taken are those of a clinical trialist and a thoughtful critic. Between the two, several realities are incontrovertible. Only two randomised controlled trials on the management of hyperglycaemia in the setting of critical illness have successfully targeted glucose values within the normal range (≤6.1 mmol/l) [5, 6]. Both demonstrate important benefits of intensive glucose management on diverse endpoints including reduced mortality for patients who require at least three days of intensive care. These studies involved patients at a high risk of mortality, whose expert care was provided within a single centre (Catholic University of Leuven, Leuven, Belgium) with specific and well-defined processes of care.

How do we assimilate and implement these realities into our practices? That is a matter of both interpretation and perspective. Van den Berghe provides a predictable and exceptionally rational argument for a target glucose level of ≤6.1 mmol/l [1]; she led the team that conducted the studies and demonstrated benefits at the centre in Leuven. Miles and colleagues suggest that the benefits observed in Leuven could be an artefact of the process of care and may not translate faithfully to other settings; admittedly, his assertions are hypotheses and unproven [2]. To add to this, the clinical trial data supporting the glucose target of ≤6.1 mmol/l are based on arterial blood measurements, and differences in the technical details of glucose measurement in the intensive care unit (ICU) can substantially affect results [7]. In many ways, none of our individual opinions in this regard is paramount, since the management of hyperglycaemia in the setting of critical illness requires a common vision and a continuous process of care involving multiple individuals from a dozen or so disciplines.

Application of clinical trial data to practice requires careful translation. Recent news on the Action to Control Cardiovascular Risk in Diabetes (ACCORD) and Action in Diabetes and Vascular Disease (ADVANCE) studies reminds us that details of clinical trial design and conduct are fundamental in testing hypotheses and in interpreting results [8, 9]. There are huge gaps between what we believe and what we know in diabetes, particularly regarding our ability to affect mortality. The vast majority of participants in studies of glucose management in the critical care setting do not have diabetes; thus, many of our thoughts and

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instincts derived from diabetes care may be inappropriate. In the ICU, glucose management is not confounded by lifestyle issues or patient compliance, and for over a decade there has been a general focus on improving and standardising processes of care. Although both papers recognise that the potential benefit of any intervention is greatest for those at highest risk, the risk of mortality from diabetes is difficult to assess at admission to the ICU. Furthermore, clinical harm from insulin-based interventions begins to accumulate almost immediately, whereas it takes time for clinical benefits to become apparent.

We have evidence that management to an average glucose level of ≤6.1 mmol/l is associated with substantial benefits at the centre in Leuven. If this experience could be reproduced worldwide, the advantage would be enormous, from the perspective of both patients and funders. However, great care is required in implementing the protocol used by a single centre, despite supporting evidence from other studies. Intensive management of hyperglycaemia in the ICU requires continuous coordinated care delivery involving a wide spectrum of healthcare and support workers, in addition to continuous assessment of outcomes. This is an approach that can neither be taken lightly, nor dismissed as inadequately established.

The American Diabetes Association, in characteristic fashion, has provided a cautious interpretation of the data that provides a reasonable common ground regarding glucose targets in the setting of critical illness [4]: 'Blood glucose levels should be kept as close to 110 mg/dl (6.1 mmol/l) as possible and generally <140 mg/dl (7.8 mmol/l)….Due to concerns regarding the risk of hypoglycemia, some institutions may consider these blood glucose levels to be overly aggressive for initial targets. Through quality improvement, glycemic goals should systematically be reduced to the recommended levels.'

Duality of interest The author declares that there is no duality of interest associated with this manuscript.

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