Model-based glycemic control in a Malaysian intensive care unit: performance and safety study

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Abstract

Background: Stress-induced hyperglycemia is common in critically ill patients. A few forms of model-based glycemic control have been introduced to reduce this phenomena and among them is the automated STAR protocol which has been used in the Christchurch and Gyula hospitals' intensive care units (ICUs) since 2010.

Methods: This article presents the pilot trial assessment of STAR protocol which has been implemented in the International Islamic University Malaysia Medical Centre (IIUMMC) Hospital ICU since December 2017. One hundred and forty-two patients who received STAR treatment for more than 20 hours were used in the assessment. The initial results are presented to discuss the ability to adopt and adapt the model-based control framework in a Malaysian environment by analyzing its performance and safety.

Results: Overall, 60.7% of blood glucose measurements were in the target band. Only 0.78% and 0.02% of cohort measurements were below 4.0 mmol/L and 2.2 mmol/L (the limitsfor mild and severe hypoglycemia, respectively). Treatment preference-wise, the clinical staff were favorable of longer intervention options when available. However, 1 hourly treatments were still used in 73.7% of cases.

Conclusion: The protocol succeeded in achieving patient-specific glycemic control while maintaining safety and was trusted by nurses to reduce workload. Its lower performance results, however, give the indication for modification in some of the control settings to better fit the Malaysian environment.

Keywords

Author Keywords: glycemic control; intensive care unit; model-based control; pilot trial; Malaysian hospital
KeyWords Plus: CRITICALLY-ILL; INSULIN THERAPY; STRESS-HYPERGLYCEMIA; MORTALITY

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