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Virtual trial of glycaemic control performance and nursing workload assessment in diabetic critically ill patients (Article)


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Abstract

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Tight glycaemic control in critically ill patients is used to reduce mortality in intensive care units. However, its usage is debatable in reducing hypoglycaemia or accurately maintain normoglycaemia level. This paper presents the assessment for two 'wider' Stochastic TARgeted (STAR) glycemc controllers, namely Controller A (blood glucose (BG) target 4.4-8.0 mmol/L) and Controller B (BG target 4.4-10.0 mmol/L) with 1 to 3 hour nursing interventions. These controllers were assessed to determine the better control on diabetic and non-diabetic patients. 66 diabetic and 66 non-diabetic critically ill patient's data from Hospital Tunku Ampuan Afzan (HTAA) were employed for virtual trial simulations with a clinically validated physiological model. Performance metrics were assessed within the percentage time in band (TIB) of 4.4 to 8.0 mmol/L, 4.4 to 10.0 mmol/L, and 6.0 to 10.0 mmol/L. Controller A shows better performance in normoglycaemic TIB of 4.4 to 10.0 mmol/L where non-diabetic and diabetic patients achieved 92.5% and 83.8% respectively. In conclusion, Controller A is higher in efficiency and safer to be used for both patients cohorts. However, higher clinical interventions in diabetic patients within this control raise the alarm to reduce nursing workload. This is believed to improve clinical interventions burnout and ensure patient's comfortability. © 2018 Authors.

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