Performance of Blood Glucose Management Protocols in HTAA Intensive Care Unit

[1,3]M. Luqman H., [1]W. Zuhriraihan W. M. Zulkifly, [1]C. Zafirah Rosly, [1]Khalijah Khalid,
[1]Ummu K. Jamaludin, [2]Azrina Md. Ralib, [2]Mohd Basri Mat Nor

[1]Faculty of Mechanical Engineering Universiti
Malaysia Pahang 26600 Pekan, Malaysia
[2]Kuliyyah of Medicine
International Islamic University Malaysia 25200
Kuantan, Malaysia
[3]*luqmanhumaidi@gmail.com*

Abstract*—Insulin Infusion Therapy (IIT) has been implemented in Malaysia Intensive Care Unit (ICU) for decades to control blood glucose level (BGL) among critically ill patients. In this study, clinical data of 210 patients treated with IIT-HTAA protocol and the minimum length of stay of 1 day were analysed. BGL, insulin and nutrition inputs were fitted using Intensive Control Insulin Nutrition Glucose (ICING) model to generate the insulin sensitivity numerically by iterative-integral method. The 95% of confidence interval and Kolmogorov-Smirnov test ($p<0.05$) were used to evaluate the performance of protocol between the Stochastic TARgeted (STAR) and HTAA protocols per cohorts and per patients. Results indicates BG median [with IQR] recorded in STAR protocol for the whole cohort statistics is lower than HTAA Protocol where 7.4 mmol/L [5.7-9.4] and 8.6 mmol/L [6.8-10.9] respectively. STAR is successful in lowering the BGL which can be seen from the % BG > 10.0 mmol/L is 19.7% while 32.8% for HTAA Protocol. The drawback from this positive result is the increment of hypoglycaemic patients (HTAA Protocol: 9; STAR: 36). Thus, STAR is the best solution in controlling the patients' BG level especially in Malaysian cohort but the enhancement of STAR have to be done to prevent the risk of hypoglycaemia by introducing patient-specific nutrition controller that can be combined with insulin infusion.

***Index Terms*— Intensive Care Unit, Insulin Infusion Therapy, Intensive Control Insulin Nutrition Glucose, Stochastic TARgeted, blood glucose, hypoglycaemia.**

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