PROBABILISTIC GLYCEMIC CONTROL DECISION SUPPORT IN ICU: PROOF OF CONCEPT USING BAYESIAN NETWORK

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Abstract

Glycemic control in intensive care patients is complex in terms of patients' response to care and treatment. The variability and the search for improved insulin therapy outcomes have led to the use of human physiology model based on per-patient metabolic condition to provide personalized automated recommendations. One of the most promising solutions for this is the STAR protocol, which is based on a clinically validated insulin-nutrition-glucose physiological model. However, this approach does not consider demographical background such as age, weight, height, and ethnicity. This article presents the extension to intensive care personalized solution by integrating per-patient demographical, and upon admission information to intensive care conditions to automate decision support for clinical staff. In this context, a virtual study was conducted on 210 retrospectives intensive care patients' data. To provide a ground, the integration concept is presented roughly, but the details are given in terms of a proof of concept using Bayesian Network, linking the admission background and performance of the STAR control. The proof of concept shows 71.43% and 73.90% overall inference precision, and reliability, respectively, on the test dataset. With more data, improved Bayesian Network is believed to be reproduced. These results, nevertheless, points at the feasibility of the network to act as an effective classifier using intensive care units data, and glycemic control performance to be the basis of a probabilistic, personalized, and automated decision support in the intensive care units.

Keywords

Author Keywords: Personalized Medicine Approach; Glycemic Control; Intensive Care Unit; Decision Support; Bayesian Network
KeyWords Plus: CRITICALLY-ILL; GLUCOSE CONTROL; SOFTWARE

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