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Levels and diagnostic value of model-based insulin sensitivity in sepsis: A preliminary study (Article)

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Abstract   ⌄ View references (24)

Background and Aims: Currently, there is a lack of real-time metric with high sensitivity and specificity to diagnose sepsis. Insulin sensitivity (SI) may be determined in real-time using mathematical glucose-insulin models; however, its effectiveness as a diagnostic test of sepsis is unknown. Our aims were to determine the levels and diagnostic value of model-based SI for identification of sepsis in critically ill patients. Materials and Methods: In this retrospective, cohort study, we analyzed SI levels in septic (n = 18) and nonseptic (n = 20) patients at 1 (baseline), 4, 8, 12, 16, 20, and 24 h of their Intensive Care Unit admission. Patients with diabetes mellitus Type I or Type II were excluded from the study. The SI levels were derived by fitting the blood glucose levels, insulin infusion and glucose input rates into the Intensive Control of Insulin-Nutrition-Glucose model. Results: The median SI levels were significantly lower in the sepsis than in the nonsepsis at all follow-up time points. The areas under the receiver operating characteristic curve of the model-based SI at baseline for discriminating sepsis from nonsepsis was 0.814 (95% confidence interval, 0.675-0.953). The optimal cutoff point of the SI test was 1.573×10^{-4} L/mu/min. At this cutoff point, the sensitivity was 77.8%, specificity was 75%, positive predictive value was 73.7%, and negative predictive value was 78.9%. Conclusions: Model-based SI ruled in and ruled out sepsis with fairly high sensitivity and specificity in our critically ill nondiabetic patients. These findings can be used as a foundation for further, prospective investigation in this area. © 2018 Indian Journal of Critical Care Medicine | Published by Wolters Kluwer - Medknow.

Author keywords

(Critical care) (diagnosis) (insulin sensitivity) (model-based) (sepsis)

Indexed keywords

EMTREE drug terms: (antibiotic agent) (corticosteroid) (glucose) (hypertensive factor) (infusion fluid) (inotropic agent) (insulin)

EMTREE medical terms: (adult) (Article) (artificial ventilation) (clinical article) (cohort analysis) (controlled study) (diagnostic value) (female) (glucose blood level) (hospital admission) (human) (inotropism) (insulin dependent diabetes mellitus) (insulin infusion) (insulin sensitivity) (intensive care unit) (male) (middle aged) (non insulin dependent diabetes mellitus) (predictive value) (receiver operating characteristic) (renal replacement therapy) (retrospective study) (sensitivity and specificity) (sepsis)

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
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