

Diabetes, Hyperglycemia, and the Cardiologist: A Call to Action for Optimizing Care

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This supplement to *Reviews in Cardiovascular Medicine* is focused on hyperglycemia and its impact on the outcomes of patients with acute cardiovascular illness. Although it has been known for some time that diabetes increases the risk for early mortality in the setting of acute myocardial infarction, it has only recently been appreciated that hyperglycemia itself, even in the absence of known diabetes, poses a similar threat. Information in this issue should make practitioners more aware of the dangers of hyperglycemia in this setting and regard this metabolic derangement as a target for intervention.

Dr. Leiter's article emphasizes that blood glucose throughout its entire range is a continuous and progressive risk factor for cardiovascular disease. Postprandial hyperglycemia is a better predictor of cardiovascular risk than fasting plasma glucose or hemoglobin A1C. The metabolic syndrome is reviewed as a grouping of cardiovascular risk factors that may also be predictive of diabetes, particularly when impaired fasting glucose is identified as one of the criteria. Dr. Fonseca reviews various methodologies for managing hyperglycemia in the

hospital and advises that intravenous insulin by continuous infusion achieves the best results. He also recommends that conversion to sliding scales should be done carefully to avoid large swings in glucose. More resources in the hospital, particularly outside the setting of intensive care units, are needed to achieve this goal. The American Diabetes Association and American Association of Clinical Endocrinologists have issued a joint consensus statement on the implementation of various strategies to manage diabetes in the hospital. Dr. Nesto's article explores the prevalence of insulin resistance syndromes in patients encountered in daily practice and in the hospital. Numerous settings in which hyperglycemia has been diagnosed at the time of an acute coronary syndrome have shown that prognosis is adversely affected by hyperglycemia, particularly above a glucose level of 140 to 150 mg/dL. Other clinical settings in which hyperglycemia plays an important role as a factor increasing morbidity and mortality include patients with acute thromboembolic strokes and patients undergoing coronary artery bypass graft surgery. These data are powerful enough to

reexamine the benefit of lowering glucose with continuous infusions of insulin in these settings.

Dr. Dandona's article brings us up-to-date on the effect of insulin as a hormone capable of arterial vasodilation as well as reducing the potential for thrombosis and inflammation. These features of insulin as a therapeutic agent could play a role in decreasing the likelihood of an adverse outcome. Next, the mechanisms responsible for the effect of acute hyperglycemia on cardiovascular function are presented by Dr. Zarich. Hyperglycemia can cause perturbations in microvascular flow within the myocardium, alter the utilization of energy substrates for the myocardium, and shift the balance toward increased thrombosis. In addition, oxidative stress is increased and hyperglycemia is associated with a pro-inflammatory state. And finally, Dr. Broder's article nicely summarizes the results of the major recent clinical trials evaluating the use of GIK in its various formulations. It is upon this information that future trials need to be designed, as the risks associated with delivery of excessive volume and glucose loads decrease with the high-dose GIK formulation.

This supplement covers the major issues that are responsible for the high residual risk for morbidity and mortality in patients in hospitalized settings even after implementation of other therapies based on current recommendations. Treating hyperglycemia by delivering insulin to patients in intensive care unit settings and during the period of cardiac surgery has shown a benefit in reducing both early and late mortality. Clinical trials in the future will more directly address whether insulin infusion in patients admitted with acute myocardial infarction will also yield comparable results. ■

Suggested Reading

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