Your patient, Ms. M., 52-year s old, is scheduled for a ventral hernia repair. While reviewing your patient’s records prior to transfer to the OR, you note that the blood sugar drawn this morning is 200mg/dl. 

What additional information do you need to obtain? What additional equipment or resources will you need to care for your patient intraoperatively? What is your patient at risk for developing based on this abnormal lab value? What additional discharge planning/teaching will this patient need?

Response:

This group rocks! The etiology of the elevated blood sugar needs to be explored further. As noted, it may range from a quick stop at McDonald’s on the way to the hospital, undiagnosed diabetes, current meds which raise blood glucose levels (steroids are a common cause), a poorly managed diabetic regimen, a secondary response to stress, or a malfunctioning glucometer. Glycolated hemoglobin (HgA1c) is considered a better indicator for glucose concentrations over a prolonged period of time and should be considered as an additional diagnostic test. Identifying co-morbidities associated with hyperglycemia (e.g. cardiovascular disease, neuropathies, hypertension, and renal disease), as well as related lab and diagnostic test results (e.g. BUN, creatinine, electrolytes, and EKG) will provide a better understanding of the extent of multi-organ involvement. Changing the IV to Lactated Ringer’s is recommended to avoid a rise in blood glucose levels in an individual already susceptible to hyperglycemia (Bower et al, 2010).

Hyperglycemia and adverse patient outcomes have been studied for more than 10 years (Kittelson, 2009). Preoperative elevated blood glucose levels were found to be a predictor for infected total knee replacements (Jamsen et al, 2010) and surgical site infections in patients undergoing mastectomy (Vilar-Compte et al, 2008). For those of you performing cardiac procedures, you are well aware of the increased risk for impaired wound healing, morbidity, and mortality in this population. Infection rates after coronary bypass surgery are consistently higher for patients with hyperglycemia (Ead, 2009). The Joint Commission, SCIP initiatives, and the Centers for Medicare and Medicaid have developed standards for target levels of blood glucose.

Risks are not limited to the cardiac surgical population or to wound infection rates. Other adverse outcomes such as cellulitis, pneumonia, urinary tract infections, cystitis, and increased length of stay in hospital are all seen more frequently in the presence of perioperative hyperglycemia. Trauma patients who are not diabetic but have
hyperglycemia are at increased risk for longer hospital stays, infections, and death (Kittelson, 2009).

The jury is still out on the safety and efficacy of tight glycemic controls, especially in the OR. Your hospital may have a protocol with specific glucose targets. Recommended target values change to correspond with results of research, so it’s a good idea to review policies frequently to assure that they reflect best practice.

It is important to recognize that hyperglycemia in and of itself does not mean the patient is diabetic. Due to the increased evidence linking hyperglycemia to adverse outcomes, both diabetic and non-diabetic patients would benefit from preoperative screening and perioperative intervention. Depending on the length of surgery and the preoperative blood glucose level, frequent intraoperative monitoring of blood glucose levels and administration of insulin intravenously during the case may be required.

As the patient advocate, look at standing orders which in and of themselves increase the risk for infection (e.g. bladder catheterization) and explore alternatives. Subsequent care providers should be notified of the elevated blood glucose level and what interventions have been implemented. The patient should be encouraged to follow up with her primary care provider. A referral to a diabetic resource nurse, case manager, or local support group can assist the patient with diet, exercise, and other lifestyle modification changes.

References:


Resources:

WebMD: Diabetes Health Center
http://diabetes.webmd.com/blood-glucose

American Diabetes Association http://www.diabetes.org/

Additional readings:


Don’t let the title of this article fool you! It contains great information applicable to all ages, including recommendations for inpatient glycemic targets and a stepwise approach to glycemic control using HbA1c values.


For all you pathophys junkies out there, there’s a great discussion on the effects of hyperglycemia on the immune system.
