Screening for Diabetes & Management of New Diabetics

Screen all patients who:

- are over 45 years old
- are overweight (BMI > 25) regardless of age
- are physically inactive
- have first degree relatives with diabetes
- are of high risk ethnicities
- delivered a baby weighing > 4kg
- hypertensive
- dyslipidaemic
- have Polycystic Ovary Syndrome
- have had Impaired Glucose Tolerance or Impaired Fasting Glucose
- have other conditions related to insulin resistance
- have a history of CVS disease

Management of newly diagnosed diabetes

Management of a patient with newly diagnosed diabetes will depend on urgency of the procedure and severity of metabolic derangement.

If BGL >11mmol/L the patient almost certainly has diabetes
If BGL is between 6.9 and 11mmol/L they may just have impaired glucose tolerance or be pre-diabetic
If BGL is below 6.9 the patient is unlikely to have diabetes.

If surgery is elective, consider postponing and referring back to the GP (or ED if the patient is unwell) for ongoing management, specialty consultation and stabilization on treatment before undergoing the procedure.

If surgery is more urgent, consider the severity of the metabolic derangement.
Consider:

Fluid status
ketosis/ketonuria
acidaemia
electrolyte disturbance
altered mental status

Discuss with the surgical and endocrine team and consider the risks of operating with poor glycaemic control and metabolic dysregulation (infection, poor wound healing, acidosis, electrolyte disturbance, increased morbidity) against the risk of postponing the procedure and the potential worsening of the indication for surgery. In the face of conflicting evidence, it would seem prudent to aim for optimal diabetic management in a timely fashion in the lead-up to surgery being careful to avoid unnecessary delays in the process.

More detailed information to accompany guideline.

1. Preoperative screening for diabetes.

Traditionally in the HEAPPS clinic, screening for diabetes has occurred in those patients over 40 years of age and there is no formal guideline for the management of patients who have an elevated blood glucose.
The American Diabetes Association (ADA) recommends all patients over 45yo and those with other risk factors (listed above) be screened for diabetes

Testing in the clinic is usually by a random glucose and therefore can only be diagnostic if >11.0mmol/L (if between 6.9 and 11, it may be diabetes or just impaired glucose tolerance) but certainly makes diabetes more likely.

Routine screening for type 1 diabetes is not recommended due to the lower incidence and more symptomatic nature of presentation. However, if a patient has symptoms or is showing signs of hyperglycaemia, it is easy to perform a random blood glucose to rule out diabetes.

2. Management of newly diagnosed diabetes

How a patient is managed after a new diagnosis of diabetes in the preoperative setting will depend on both the urgency of surgery and degree of metabolic derangement upon diagnosis.

In type 1 diabetes hypoinsulinaemia results in an excessive, unopposed level of glucagon and a catabolic state. This is associated with the production of ketones. If the patient is producing ketones, they are also likely to be dehydrated and acidaemic, making anaesthesia and surgery more dangerous. Ketones appear in the urine long before any appreciable rise in blood levels so ketonuria is a sensitive test to detect a metabolic switch from carbohydrate to fatty acid metabolism due to an insulin defecit(wikipedia). However, ketonuria can also just be a sign of starvation secondary to the fasting process.

In type 2 diabetes, prolonged hyperglycaemia can lead to a hyperosmolar state which most commonly manifests as severe dehydration and altered mental status.

How to proceed will be based on an individual risk benefit assessment for each patient.
Undergoing surgery whilst hyperglycaemic is associated with increased infection rates (sepsis, pneumonia, UTI and wound), poor wound healing as well as increased all-cause morbidity and mortality. Postponing surgery may lead to a deterioration of the condition requiring surgery in the first instance. In the acutely unwell patient, hyperglycaemia may be a manifestation of a stress response and not necessarily be diagnostic or indicative of diabetes mellitus.

In known diabetics with a recent history of poor glycaemic control, there is no evidence supporting a rapid preoperative improvement in control over hours to days. (Sheehy) Furthermore, in the context of less urgent surgery there is also no evidence that rapid correction of Hba1C in the 3 months preceding surgery has any benefit (ACCORD, Suto). However, in contrast, poor perioperative glycaemic control leads to worse outcomes (sheehy & references).
Given the seemingly contradictory nature of the literature, evidence-based recommendations cannot be made. If surgery is emergent, gaining metabolic control with administration of insulin, fluid resuscitation, management of electrolyte disturbances and avoidance of hyperglycaemia AND hypoglycaemia should proceed alongside routine preparation for surgery. Engage the endocrine

team for advise on how to proceed during the preoperative phase and to ensure post-operative follow-up, ongoing management and patient education.

In the preoperative clinic setting, if surgery is truly elective or not time critical, the patient is best referred back to their GP for ongoing management and stabilization. If the patient is unwell or unstable consider transfer to the emergency department for resuscitation, a complete workup and referral to endocrinology. Be sure to liaise with the surgical team.

References

Sheehy A, Gabbay R. *An Overview of Preoperative Glucose Evaluation, Management, and Perioperative Impact.* Journal of Diabetes Science and Technology 2009;6(3) 1261-1269

Nicholson G, Hall, G. *Diabetes and adult surgical inpatients* Continuing Education in Anaesthesia, Critical Care & Pain 2011; 11(6) 234-238.

American Diabetes Association. *Standards of medical care in diabetes--2009*. Diabetes Care. 2009;32 Suppl 1:S13-S61.

The Action to Control Cardiovascular Risk in Diabetes Study Group, *Effects of Intensive Glucose Lowering in Type 2 Diabetes.* The New England Journal of Medicine 2008, 358(24) 2545-2559.

Miller J, *Miller's Anesthesia 7th ed.,* (Online) Elsevier 2009.

Meneghini L, *Management of diabetes: Translating evidence into practice.* Cleveland Clinic Journal of Medicine. 2009, 76 (Supplement 4), S53-S59

Hines L, Marschall K. *Stoelting's Anaesthesia and Co-existing Disease*. Churchill Livingstone, 2008.

UpToDate online textbook: http://www.uptodate.com

PR
Draft 1