

Challenges in Perioperative Medication Management

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Learning Objectives

- » Appropriate use of beta-blockers
- Management of diabetes drugs
- Management of immunosuppressive drugs

Case 1

- 70 year-old female with history of myocardial infarction
- Undergoing total knee arthroplasty
- Metoprolol 50 mg two times a day
- Heart rate 85

Case 2

- 55 year-old male with no known coronary artery disease
- Undergoing abdominal aortic aneurysm repair
- History of diabetes with nephropathy (creatinine 2.3)
- Heart rate 80

Perioperative Beta-blockers

- Protect against myocardial ischemia in the perioperative period
- Recommended for select high-risk populations in the 2007 ACC/AHA perioperative guidelines

POISE trial

- Non-cardiac surgery patients randomized to placebo or metoprolol XL
- Metoprolol XL 100 mg 2-4 hours preop
- Metoprolol XL 100 mg within 6 hours post-op
- Metoprolol XL 200 mg daily starting 12 hours after the first post-op dose for 30 days

Lancet. 2008;371:1839-1847.

POISE trial

- Included 8,351 patients from 190 hospitals in 23 countries
- Metoprolol group had a decrease in non-fatal MI
 - 4.2% vs. 5.7% in the placebo group
- Metoprolol group had an increase in strokes
 - 1.0% vs. 0.5% in the placebo group

Lancet. 2008;371:1839-1847.

Post-POISE

- ACC/AHA 2009 update
 - Continue beta-blockers if taking for appropriate indications
 - Beneficial in select high-risk populations
 - Titrate to heart rate goal of 50-70
 - Routine administration of high-dose beta-blockers without dose titration may be harmful

J Am Coll Cardiol. 2009;54:2102-2128.

High-risk populations

- High-risk surgery
 - Vascular
- High-risk patient
 - Revised Cardiac Risk Index (RCRI) > 1
 - Coronary artery disease
 - Cerebrovascular disease
 - Congestive heart failure
 - Chronic kidney disease (creatinine > 2 mg/dl)
 - Diabetes

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Outline

- Beta-blockers
- » Diabetes drugs
- Immunosuppressive drugs

Case 3

- 56 year-old female with diabetes undergoing appendectomy
- Metformin 1000 mg twice a day
- Pioglitazone 45 mg daily
- NPH insulin 40 units in the morning, 20 units at night

Oral Diabetes Drugs

- Metformin
 - Risk of lactic acidosis in renal failure
 - FDA Black Box Warning to discontinue before any intravascular radiocontrast study or surgical procedure
 - Stop 24 hours before surgery
 - Restart 48-72 hours after
 - Confirm normal renal function before restarting

Med Clin N Am. 2009;93:1031-1047.

Oral Diabetes Drugs

- Sulfonylureas (glimepiride, glipizide, glyburide)
 - Stop the night before surgery
- Incretins (exenatide, sitagliptin)
 - Safe to continue
- Thiazolidinediones (pioglitazone, rosiglitazone)
 - Safe to continue

Insulins

- Regular/lispro/aspart/glulisine: stop 4 hours before surgery
- NPH: Half the dose before surgery with D5 drip perioperatively
- Glargine/detemir: no dose adjustment
- Insulin pump: continue basal rate

Med Clin N Am. 2009;93:1031-1047.

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Outline

- Beta-blockers
- Diabetes drugs
- » Immunosuppressive drugs

Case 4

- 62 year-old male with rheumatoid arthritis undergoing bowel resection
- Prednisone 20 mg daily
- Etanercept 50 mg weekly

Corticosteroids

- Surgery triggers release of 50-150 mg cortisol
- For patients on chronic corticosteroids
 - Continue home corticosteroid dose
 - Add a stress dose to cover the surgery

Endocrinol Metab Clin N Am. 2003;32:367-383.

Stress-dose Corticosteroids

- Minor surgery
 - Local anesthesia, duration less than one hour
 - Hydrocortisone 25 mg IV or methylprednisolone 5 mg IV during surgery

Endocrinol Metab Clin N Am. 2003;32:367-383.

Stress-dose Corticosteroids

- Moderate surgery
 - Lower extremity vascular, joint replacement, open cholecystectomy
 - Hydrocortisone 50-75 mg IV or methylprednisolone 10-15 mg IV during surgery
 - Taper to baseline dose over 1-2 days

Endocrinol Metab Clin N Am. 2003;32:367-383.

Stress-dose Corticosteroids

- Major surgery
 - Cardiothoracic, vascular, Whipple
 - Methylprednisolone 10 mg IV every 8 hours starting in surgery
 - Taper to baseline dose over 2-3 days
 - Hydrocortisone not recommended due to potential for excessive fluid retention at doses exceeding 100 mg/day

Endocrinol Metab Clin N Am. 2003;32:367-383.

DMARDs

- Hydroxychloroquine
 - Safe to continue
- Azathioprine, leflunomide, sulfasalazine
 - Stop the day before surgery
 - Resume 3 days after surgery
- Methotrexate
 - Risk of wound complications vs. risk of disease progression

Biologics

- TNF inhibitors (adalimumab, etanercept, infliximab)
- IL1 antagonists (anakinra)
- Anti-CD20 (rituximab)
- Risk of wound complications vs. risk of disease progression
 - Stop 1 week before surgery
 - Resume 1 week after surgery

Arthritis Rheum. 2008;59:762-784.

Case 4

- 62 year-old male with rheumatoid arthritis undergoing bowel resection
- Prednisone 20 mg daily
- Etanercept 50 mg weekly

Summary

- Beta-blockers
 - Beneficial in select high-risk patients
 - Should be titrated to heart rate goals
- Diabetes drugs
 - Glycemic control vs. risk of hypoglycemia
- Immunosuppressive drugs
 - Home dose plus stress-dose for steroids
 - Hold DMARDs and biologics
