Perioperative Management of Patients with HIV Infection

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Introduction: much data on surgical outcomes of patients infected with human immunodeficiency virus (HIV) from 1980s and early 1990s, which predates current effective treatment; surgical outcomes of patients with HIV infection who receive appropriate treatment similar to those of patients without HIV infection

Surgical outcomes: King et al (2015) reviewed patients with HIV infection who had undergone surgery; data from 1996 (approximate time that highly active antiretroviral therapy [HAART] first became available) to 2010; ratio of infected patients to noninfected patients 2:1; 30-day risk of surgical mortality low, estimated time that highly active antiretroviral therapy [HAART] may have chronic hepatitis), serum creatinine (and, if increased, urinalysis to check for proteinuria, which can be due to HIV nephropathy), and CD4 count and viral load; assessment of patients with HIV infection focuses on viral suppression and CD4 count (important to obtain these values preoperatively and not during acute illness); CD4 count useful surrogate for immune function

Preoperative evaluation: patients with HIV infection tend to age more rapidly and have more comorbidities than noninfected patients; comorbidities may include metabolic abnormalities (eg, lipodystrophy), increased risk for heart disease (often occult), chronic pulmonary disease, impaired glucose tolerance and diabetes (due in part to metabolic disorders and distribution of fat), hypercholesterolemia, disordered bone metabolism, renal dysfunction, cognitive impairment (may be subclinical), and lifestyle issues (eg, use of tobacco, alcohol, and other drugs)

Laboratory tests: perform thorough evaluation; consult with provider treating HIV infection; tests include complete blood count (thrombocytopenia and pancytopenia observed in advanced disease), blood glucose, liver function (patients may have chronic hepatitis), serum creatinine (and, if increased, urinalysis to check for proteinuria, which can be due to HIV nephropathy), and CD4 count and viral load; assessment of patients with HIV infection focuses on viral suppression and CD4 count (important to obtain these values preoperatively and not during acute illness); CD4 count useful surrogate for immune function

History: obtain history of opportunistic infections such as Pneumocystis carinii pneumonia and cytomegalovirus (uncommon in patients adequately treated), viral hepatitis (anesthesia associated with increased risk for decompensated liver failure), and medications (patients with HIV infection typically on complex regimens)

Preoperative considerations: for elective surgery, viral suppression desirable; for urgent procedures (such as hip fracture repair), high viral load acceptable

Social support: social networks vary among patients with HIV infection; patient may be estranged from family, partner may not be legal spouse, patient may have mental illness, and/or patient may have poor social support; these issues can serve as barriers to discharge and rehabilitation

Perioperative care: treatment of HIV infection complex; few providers familiar with it; HAART involves combination of drugs and complex drug interactions; important to garner support from pharmacy; pain medications can affect drug levels; important to continue HAART through perioperative period if possible; patient should take own medications while in hospital; if patient unable to take oral medications, suspend HAART; for extended period of nil per os must consider other options and consult with infectious disease specialist; some intravenous alternatives available; renal dosing necessary for several common agents

Special perioperative risks: deep venous thrombosis, poor wound healing, infection, altered mental state, and delirium (which can be subclinical); cognitive impairment and medications can contribute to changes in mental state; pain management may present challenges (eg, history of substance abuse)

Prevention of HIV transmission in health care workers: Joyce et al (2015) reported 58 cases of occupationally acquired HIV infection in health care workers in United States from 1985 to 2013; only 1 case reported since 1999; success in prevention probably due to increased awareness and because most patients virally suppressed; risk of occupational transmission varies by type and severity of event (estimated to be ~0.3%); management after exposure — wash site of needle stick or wound with soap and water; flush splashes and irrigate eyes; consider postexposure prophylaxis; current guidelines recommend administering tenofovir and emtricitabine (eficacious and well tolerated); be mindful that health care workers have died from complications of prophylaxis; consult with occupational health and infectious disease specialists

Suggested Reading


Educational Objectives

The goals of this program are to prevent surgical site infection and improve the perioperative management of patients infected with human immunodeficiency virus (HIV), patients already on steroids, and patients who refuse blood products. After hearing and assimilating this program, the clinician will be better able to:

1. Evaluate an HIV-infected patient for surgery.
2. Counsel an HIV-infected patient about continuing HAART therapy in the perioperative setting.
3. Select the appropriate antibiotic prophylaxis to prevent surgical site infection.
4. Choose the appropriate stress dose for patients on steroids scheduled for surgery.
5. List blood components acceptable for transfusion to Jehovah’s Witnesses.

Faculty Disclosure

In adherence to ACCME Standards for Commercial Support, Audio Digest requires all faculty and members of the planning committee to disclose relevant financial relationships within the past 12 months that might create any personal conflicts of interest. Any identified conflicts were resolved to ensure that this educational activity promotes quality in health care and not a proprietary business or commercial interest. For this program, members of the faculty and planning committee reported nothing to disclose.
A Primer on Surgical Site Infection

Dr. Malani

Clinical challenge: hand hygiene more important than perioperative vancomycin, tight glucose control, or skill of surgeon in terms of preventing surgical site infection (SSI); definition of SSI — infection related to operative procedure either at or near incision; occurs within 30 days of procedure, within 90 days if prosthetic material left in place, and within 1 yr with implants; magnitude of problem — most common health care–associated infection in United States; highest rates associated with abdominal operations; SSI linked to increased postoperative morbidity, mortality, length of stay, cost, and need for rehospitalization; major cause of postoperative mortality; National Surgical Quality Improvement Program data — SSI most common reason for unplanned admission (rate 19.5%); rates varied by procedure (eg, hysterectomy 29%, vascular bypass 36%)

Risk factors for SSI: include diabetes, obesity, smoking, immunosuppression, older age, and concurrent infection at other site; factors related to procedure include sterilization, technique, duration of operation, skin antiseptic, thermoregulation, and glycemic control; other risk factors — blood transfusions, excessive use of electrocautery, and hair removal (clipping vs razors)

Antimicrobial prophylaxis: goal to decrease burden of microorganisms at surgical site (usually skin flora); rate of SSI decreased if antibiotics given 1 to 2 hr before incision; prospective randomized studies from 1980s show clear benefit of prophylaxis; antibiotics should be completely infused 60 min prior to incision; 2005 study of 34,000 patients showed that 56% of patients received antibiotics within 1 hr of incision; antibiotics stopped after 24 hr in only 41% of cases; antibiotics should be discontinued after 24 hr for almost all operations; selection of antibiotics — based on safety, cost, bactericidal activity, and kinetics; few studies have compared agents; cefazolin agent of choice for many procedures; cefuroxime and cefotetan sometimes used as alternatives; vancomycin and clindamycin can be used if patient has serious allergy to β-lactam agents; important to clarify whether true allergy exists; vancomycin — less effective than cefazolin in preventing SSSIs caused by methicillin-sensitive Staphylococcus aureus; should be considered for clusters of methicillin-resistant S aureus (MRSA) and in patients at high risk for MRSA colonization (eg, dialysis and extended stay in intensive care unit); if vancomycin administered, cefazolin or other agent should be given also (cefazolin offers different spectrum, eg, gram-negative coverage); vancomycin has long half-life, and usually single dose adequate

SSI diagnostic criteria: purulent exudate from surgical site consistent with infection; positive cultures from primarily closed surgical wound; attending surgeon making diagnosis of infection; reopening of surgical site

Management of SSI: choice of antimicrobial agent should be guided by culture results; however, start treatment with broad-spectrum antibiotics; cultures should be obtained before administration of antibiotics; imaging — can be misleading; drainage of infection — depends on whether open or percutaneous; consult with infectious disease specialist — important because patients may need weeks of treatment and outpatient follow-up

Suggested Reading


Stress Dose Steroids in the Perioperative Setting

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Case example: 58-yr-old woman on steroids for 20 yr for rheumatoid arthritis now transitioning to etanercept; prednisone has been tapered over past 6 mo; current dose 5 mg; patient scheduled for right total hip arthroplasty; choices of perioperative steroids include 1) hydrocortisone 100 mg intravenously every 8 hr and tapered over 2 to 3 days, 2) hydrocortisone 25 mg intravenously every 8 hr and tapered over 1 to 2 days, 3) obtain preoperative adrenocorticotropic hormone stimulation test to determine risk of adrenal insufficiency, and 4) no stress dose needed

Adrenal insufficiency: adrenal crisis rare but life threatening; hypothalamic-pituitary-adrenal (HPA) axis can be suppressed with variable doses of steroids; adrenal glands slow to recover from exogenous administration of steroids (up to 1 yr); HPA axis activated with most surgical procedures; in absence of adrenal glands, 10 to 12 mg of hydrocortisone required daily; 75 to 150 mg required daily during periods of stress (eg, major surgery); requirements usually return to baseline within 2 days of surgery

Clinical data on perioperative management: systematic review by Mark and Varon (2008) included 9 studies (2 prospective randomized trials and 7 cohort studies) involving 315 patients; all patients presenting to surgery already on steroids; in 5 studies patients received usual dose of steroids, with no reports of hypotension or adrenal crisis; study concluded that perioperative stress doses of steroids not routinely needed; important that usual dose of steroids be given on morning of surgery; Cochrane review (2012) — included 2 randomized controlled trials involving only 37 patients; study found no evidence to support or refute use of supplemental steroids; however, no adverse events associated with use of supplemental steroids observed

Disadvantages of stress doses: steroids potentially interfere with ability of body to repair tissue, and increase risk for infection, hyperglycemia, psychosis, and electrolyte disturbances; usually, short courses of high doses do not cause problems; Cleveland Clinic study — looked at 235 patients undergoing proctocolectomy for ulcerative colitis who were either receiving or had recently stopped steroids; 89 patients received preoperative stress doses and 146 did not; sinus tachycardia only outcome noted to be more common in patients receiving stress doses; study concluded that stress doses do not appear to affect adrenal insufficiency nor do they increase complications

Recommendations: determine whether patient exposed to steroids within past 12 mo; prednisone 20 mg/day for 5 days suppresses HPA axis; do not perform adrenocorticotropic hormone stimulation test if patient already on steroids, continue at usual dose if possible; patients on prednisone ≤5 mg daily do not usually require stress dose

Conclusion: data supporting administration of stress doses limited; low-risk intervention; decision to administer stress dose depends on procedure; for small procedures (eg, dental work, skin biopsies), no stress dose necessary; for minor procedures, give single dose on day of surgery; for moderate procedures, give 25 mg every 8 hr, then taper over 1 to 2 days; for major surgery, give 50 mg every 8 hr, then taper over 2 to 3 days; for case example, give 25 mg every 8 hr, then taper over 1 to 2 days, but no stress dose also acceptable
Suggested Reading


Perioperative Management of Patients Who Refuse Blood Products

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Challenges of treating Jehovah’s Witnesses: aside from refusing blood transfusion, they expect good medical care; historically ostracized from communities if they receive transfusion; movement called Associated Jehovah’s Witnesses for Reform on Blood Transfusion questions practice of refusal; clinicians encouraged to talk to patient alone without spouse or others present; when asked whether they would rather die than take blood, patient should be alone; legal basis to refuse blood transfusion found in First Amendment (freedom of religion); however, this right has limitations; states maintain rights to protect children; suicide remains illegal; right of protecting integrity of professional organizations (eg, medicine) may be competing ethic; competent adults have right to die; areas of uncertainty include pregnant women and adults not deemed competent; if patient not competent, providers should err on side of saving life (eg, no legal basis for withholding blood in case of patient presenting to hospital comatose and friend states patient would rather die than accept blood transfusion); only contemporaneous decision protected legally; wallet card proven to belong to patient legally acceptable

Ethical beliefs of clinicians: acceptable to consider unethical patient decision to die if death preventable; however, patient cannot be abandoned, and must be transferred to another caregiver; in most states, clinicians in emergency situations required to set aside their beliefs and care for patient

Caring for patients who refuse blood transfusion: minimize blood loss; must clarify with patients whether albumin acceptable (derived from human serum); components (eg, red blood cells, white blood cells, plasma, platelets) usually prohibited by Jehovah’s Witnesses; however, some will take plasma; ask about each blood component; erythropoietin contains human albumin; erythropoietin with hetastarch available; cell saver — permitted by Watchtower as long as continuity of circuit maintained; autologous blood usually not acceptable; factor VII, factor VIII, and factor IX acceptable

Other challenges: organ donation — usually acceptable if organ devoid of blood; bone marrow transplantation — not acceptable; epidural blood patch — possible to perform by maintaining circuit between drawing of blood and infusing into epidural catheter

Suggested Reading


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Estimated time to complete the educational process:

Review Educational Objectives on page 1 5 minutes
Take pretest 10 minutes
Listen to audio program 60 minutes
Review written summary and suggested readings 35 minutes
Take posttest 10 minutes
1. Compared with patients not infected with human immunodeficiency virus (HIV), patients with HIV infection who receive appropriate treatment tend to have _______ surgical outcomes.
   (A) Worse (B) Better (C) Similar

2. In which of the following decades did highly active antiretroviral therapy (HAART) first become available?
   (A) 1980s (B) 1990s (C) 2000s (D) 2010s

3. Which of the following statements about the perioperative management of patients with HIV infection is true?
   (A) Screening for viral hepatitis should be performed because anesthesia is associated with increased risk for decompensated liver failure
   (B) A high viral load is unacceptable for surgery under any circumstances
   (C) Pain medications have no effect on drug levels used in HAART
   (D) Hospital staff should assume the task of dispensing oral HAART while the patient is in hospital

4. Which of the following is most important in terms of preventing surgical site infection (SSI)?
   (A) Perioperative vancomycin (B) Skill of surgeon (C) Tight glucose control (D) Hand hygiene

5. Which of the following is the recommended regimen for the administration of perioperative antibiotics?
   (A) Infusion started 1 hr prior to surgery (B) Infusion completed 1 hr prior to surgery
   (C) Infusion started 30 min prior to surgery (D) Infusion at time of incision

6. In the management of SSI, the choice of antimicrobial agent should be guided by:
   (A) Whether the infection is open or percutaneous (B) Age of the patient
   (C) Type of surgery (D) Culture results

7. In a Cleveland Clinic study of 235 patients undergoing proctocolectomy for ulcerative colitis who were either receiving or had recently stopped steroids, which of the following outcomes was noted to be more common if stress doses were administered?
   (A) Sinus tachycardia (B) SSI
   (C) Hyperglycemia (D) Psychosis

8. A 58-yr-old woman with a 20-yr history of steroid treatment for rheumatoid arthritis is scheduled for right total hip arthroplasty. The steroid dose has been tapered and is currently 5 mg. Which of the following is the most appropriate course of action in the perioperative management of steroids?
   (A) Administer hydrocortisone 100 mg intravenously every 8 hr and tapered over 2 to 3 days
   (B) Administer hydrocortisone 50 mg intravenously every 8 hr and tapered over 2 to 3 days
   (C) Administer hydrocortisone 25 mg intravenously every 8 hr and tapered over 1 to 2 days
   (D) Perform preoperative adrenocorticotropic hormone stimulation test to determine risk of adrenal insufficiency

9. The transfusion of which of the following is acceptable to Jehovah’s Witnesses?
   (A) Factor VII (B) Factor VIII
   (C) Factor IX (D) All the above

10. All the following are usually acceptable for transplantation to Jehovah’s Witnesses, EXCEPT:
    (A) Heart (B) Bone marrow
    (C) Liver (D) Kidney

Answers to Audio Digest Anesthesiology Volume 58, Issue 09: 1-D, 2-A, 3-D, 4-B, 5-A, 6-D, 7-A, 8-B, 9-B, 10-A