Smallpox

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Risk

- Declared eradicated worldwide in 1980.
- Two repositories hold the variola virus: VECTOR in Koltsovo, Novosibirsk, Russia, and the CDC in Atlanta, Georgia, USA.
- Potential agent of bioterrorism.
- Vaccinations are not administered to the general public.
  - In 2007, ACAM2000, the newest version of vaccine made of vaccinia virus, became part of the USA stockpile of smallpox vaccines.

Perioperative Risks

- Hemodynamic compromise from dehydration and/or sepsis

Worry About

- Facility and provider contamination

Overview

- Virus enters respiratory tract, migrates into pulmonary lymph nodes, and spreads into the bloodstream.
- Incubation period is 7–17 d; at this point, not contagious.
- Prodromal phase is 2–3 d. Abrupt, severe headache, backache, and fever; possibly contagious.
- Rash develops, increases, and lasts for weeks; this is contagious:
  - Mucous membrane enanthemas, then skin lesions.
  - Centrifugal spread.
  - Starts on extremities and spreads to trunk.
  - Deep-seated, firm, round pustules, leading to rupture and necrosis. leading to scabs.
  - Lesions all in same stage of development.
- Contagious until resolution of scabs.
- Approximate 30% mortality; death primarily from sepsis.
- Must be distinguished from chicken pox (varicella):
  - No prodrome.
  - Lesions centripetal spread.
  - Start on trunk.
  - Superficial vesicles.
  - Lesions in different stages.

Etiology

- Caused by *Orthopoxvirus variola*
- Human vector only
- Transmission via prolonged, inhalational contact with infected bodily fluid or contaminated material

Usual Treatment

- No direct treatment.
- Early stage: Vaccination
- All stages: Supportive (hydration, nutrition).
- Treat secondary infections.
- Prevent further viral contraction: Use respiratory and contact precautions, pt isolation, negative pressure room, and quarantine exposed persons.

Assessment Points

System	Effect	Assessment by Hx	PE	Test
HEENT	Oral/mucosal enanthemas Rash Corneal ulceration (rare)	Centrifugal lesion spread Ocular pain	Pox lesions: Vesicular or pustular	CBC, differential, virus titer, PCR Ophthalmology exam
RESP	Respiratory viral infection Bacterial pneumonia	Often asymptomatic		Virus titer Sputum smear for Guarnieri bodies CXR, CBC
CV	None			
GI	Occasionally abdominal pain and/or diarrhea with prodrome			
CNS	Constitutional symptoms Encephalitis	Sudden onset, severe headache, backache, malaise	Temp >38.1° C Delirious	CBC, differential
HEME	Disseminated intravascular hemolysis	Mucosal bleeding	Epistaxis, gastrointestinal bleeding, hemoptysis, subconjunctival and/or gum bleeding	CBC, peripheral smear, D-dimer, PT, aPTT, fibrinogen
METAB	Dehydration Malnutrition	Poor oral intake	Dry mucus membranes, tenting skin, subcutaneous fluid accumulation, massive skin desquamation	Electrolytes, Ca^{2+}, Mg^{2+}, albumin, prealbumin

Key References: Breman JG, Henderson DA: Diagnosis and management of smallpox, *N Engl J Med* 346(17):1300–1308, 2002; Schumacher J, Runte J, Brinker A, et al.: Respiratory protection during high-fidelity simulated resuscitation of casualties contaminated with chemical warfare agents, *Anaesthesia* 63(6):593–598, 2008; Neligan P: Smallpox. In Fleisher LA, editor: *Anesthesia and uncommon disease*, ed 6, Philadelphia, PA, 2012, Saunders, pp 392–393.

Perioperative Implications

Preoperative Preparation

- Anesthesiologists would be among the first responders to those affected by a biologic terrorist attack.
- Pt resuscitation and any airway management would need to be administered with special attention to provider respiratory protection, including contact precautions and wearing a N95 mask.
- Vaccinate providers as indicated by CDC guidelines.

Monitoring

- Consider arterial line or CVP catheter as indicated.

Airway

- Caution with provider exposure to airway secretions
- Gentle manipulation of airway if friable oral lesions are present

Preinduction/Induction

- Pt likely to be extremely dehydrated; hydrate before induction and/or gentle induction.

Maintenance

- Manage as appropriate for surgical procedure.
- Adequate hydration; continue TPN if being nutritionally supported.
- Dispose of all used materials in appropriate biohazard containers.

Extubation

- Avoid excessive coughing to minimize viral particulate spread.

Postoperative Period

- Continue medical support.
- Diligence in washing hands and returning of soiled scrubs by personnel.

Anticipated Problems/Concerns

- Strict infection control needs to be continued.
- Follow CDC recommendations if provider exposed.

Spasmodic Torticollis

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Risk

- Estimated prevalence of 9 cases per 100,000.
- ST, also known as cervical dystonia, is the most common form of focal dystonia.
- Peak incidence is in the fifth decade.
- Two times more common in females.
- 80% of cases are sporadic or primary.
- 20% of cases are secondary to an underlying brain lesion or trauma.

Perioperative Risks

- Dysphagia
- Aspiration
- Consider comorbid neurologic problems such as seizures, cranial nerve palsies, hemiplegia, and so forth.