

TOPIC #3: Smallpox vaccination policy

Background:

With recent concerns regarding the possibility of Variola major (Smallpox virus) being released as a bioterror agent in major population centers of the US, there has been on-going discussion of reinstating a vaccination program against this deadly virus. While the vaccine against Smallpox (vaccinia virus) was regarded as “safe” at a time when Smallpox epidemics were still killing large numbers world-wide, vaccination with vaccinia was not without complications. Deaths from post-vaccinia encephalitis were high (1 out of ~80,000 primary vaccinees in the US in 1968) with non-lethal systemic infections occurring in 1 out of ~4000 primary vaccinees. Given that a “weaponized” form of Smallpox would likely have a mortality rate at least as high as previous Variola major strains (25 – 40%), the current debate focuses over whether to push for revaccination of a large sector of the US population or to vaccinate only *after* a bioterror attack in the immediate area around the attack as a means of containment. Plans are already underway to produce sufficient vaccinia for either scenario. In addition, there are to consider the use of “safer” vaccines against Smallpox, such as the MVA strain (more attenuated than those previously used in the US), or to use more modern sub-unit or recombinant vaccine approaches. The argument against using these vaccines is that they are largely un-tested in humans (and there is no animal model for Variola), so actual efficacy is unknown.

Discuss the background and the major issues surrounding this controversy. What is “acceptable risk” for the use of the current vaccine? How would one deal with the large population of immunosuppressed individuals (such as HIV-infected) that would likely not be candidates for vaccination, and may not know their status? Even if a nationwide vaccine program is not instituted, should vaccine be made available to those who want it? Would you elect to have the vaccine yourself?

Starter References

Drazen, J.M. (2002). Smallpox and Bioterrorism. N. Engl. J. Med. **17**:1262-1263.

In search of a kinder, gentler vaccine. (2002). Science **296**:1594.

Other Resources

<http://www.cdc.gov/ncidod/EID/vol5no4/otoole.htm>

Review Points

Because of the nature of small group discussions, we expect (and hope) that each group will cover slightly different aspects of each topic. In order to make sure that key aspects of each topic are covered by all groups, please make sure that the discussions in your group includes the following points. It is from these points that exam questions will be drawn.

Controversy #3 Reinstating vaccination against Smallpox

- Be sure the discussion includes an appreciation for the risks associated with the current (Wyeth) strain of *vaccinia as well as* and appreciation of the number of fatalities that would result from 1000 unvaccinated people being exposed to Smallpox.
- Be sure the discussion includes the potential use of alternative vaccines (such as sub-unit vaccines) that may have higher safety and could be used in immunocompromised individuals.
- Finally, someone should point out that since Smallpox has virtually no prodromal period that containment of an initial outbreak is made easier by the fact that infectious persons are readily identifiable.