Bioterrorism and Vaccine Events Remain Threats

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SCOTTSDALE, ARIZ. — Despite the grateful lull that has followed Sept. 11 and the anthrax scare in 2001, bioterrorism remains a very real threat, according to a Food and Drug Administration counterterrorism official.

Dr. Boris Lushniak, the FDA's assistant commissioner for counterterrorism policy and assistant U.S. surgeon general, hopes that vigilance remains active in medical offices and emergency departments across the United States—but he has his doubts.

"I daresay we are going to be caught off guard," Dr. Lushniak said during the Alfred L. Weiner Lecture at the annual meeting of the Noah Worcester Dermatological Society.

A disturbing number of organisms meet all or some of the criteria for an ideal agent of biological terrorism: easy to obtain and work with, inexpensive to produce, able to be widely disseminated, fairly stable in the environment, capable of producing high morbidity and mortality, transmissible from person to person, and difficult to diagnose and treat, which would allow an attack to quickly overwhelm the health care system.

On a positive note, the U.S. government has now stockpiled enough vaccine against smallpox to inoculate every man, woman, and child in the country, Dr. Lushniak reported.

On the other hand, when U.S. public health authorities were notified recently about an individual with suspicious skin lesions on an inbound flight from China, they were unable to find any hospital in a major metropolitan area willing to admit and quarantine the 200 people aboard until danger to the public was ruled out.

Fortunately, in that case, the threat was nullified during 4 hours of frantic planning as the airliner approached U.S. shores, but it stands as a wake-up call about preparedness. "We really have to change the way we do our business," he said.

The potential agents of greatest concern—labeled category A by the Centers for Disease Control and Prevention—remain the same as ever: anthrax, smallpox, plague, tularemia, viral hemorrhagic fevers, and botulinum toxin.

"All suspicious or confirmed cases should be reported to health authorities immediately," Dr. Lushniak said.

"We should all have that high level of suspicion. If you're worried, if you think it's part of your differential, you really should give someone a call. It may be a false alarm, may be overreading, but … really what we're looking for is someone to be able to ring that first fire alarm," he said.

The timing could be critical.

Anthrax, for example, can be controlled with antibiotics if it is recognized and treated with postexposure prophylaxis before protein-rich toxins are produced by the organism. "If you can nip it in the spore bud, so to speak, then you really have solved the problem," he said.

The disease is heralded by a flulike prodrome, progressing to hypoxia, dyspnea, and, often, mediastinal widening on x-ray.

He reminded dermatologists of the clinical presentation of cutaneous anthrax exposure following a 1- to 12-day incubation period. The presenting symptom might be tender pruritic macules that evolve into papules, which progress to vesicles and bullae formation in 24-48 hours. Bullae may rupture when they reach 1-2 cm. Eventually, telltale black necrotic ulcers may be seen, with a black eschar visible by day 6.

Differential diagnoses for cutaneous anthrax include brown recluse spider bites, ecthyma gangrenosum, tularemia, staph infections, and herpes labialis.

If smallpox is ever used in a bioterrorist attack, the tip-off may be its severe prodrome, which follows a noninfectious incubation period lasting 7-17 days, Dr. Lushniak said.

For 2-4 days, infected patients have very high fevers (101° F-104° F), prostration, myalgias, and malaise as small red macules and papules begin to form and even ulcerate on the tongue and mouth. An exanthem then appears in a centrifugal pattern on the face, arms, hands, legs, and feet. Macules form, then papules. By day 5, tense, often umbilicated vesicles can be seen that look like "BB pellets embedded in the skin," he noted.

By day 6-12, pustules begin to form crusts that remain intact throughout a long period of infection until they separate at about day 28, leaving depressed scars.

Differential diagnoses include varicella, molluscum contagiosum, hand-foot-and-mouth disease, disseminated herpes simplex virus, herpes zoster, pustular drug eruptions, and scabies.

"If this were to come back into the world, the feeling is that at least the prodrome may keep people at home, in bed," he said.

Even preventive efforts aimed at a potential bioterrorism attack have health implications that physicians should recognize, Dr. Lushniak said.

He described a 2007 case of household transmission of the live virus through a smallpox vaccine. Within a month of the father having received a smallpox vaccination prior to military deployment overseas, he came into contact with his infant son, who had eczema.

Although the father's vaccine site was covered during the unplanned visit, the child developed a high fever and a generalized papular, vesicular rash that began on the head and neck. Within days, umbilicated lesions covered more than 50% of the child's body and he required mechanical ventilation.

After a course of antiviral and vasopressor medications, intravenous immunoglobulin, and supportive therapy, the child was discharged from the hospital—48 days after admission.

His mother, who had rested her head on the child's chest at one point, also developed a mild vesicular rash on her face.

Cell cultures in the home found evidence of the virus on a booster seat, a toy, and a slipper.

"This ain't real smallpox, people!" Dr. Lushniak said to emphasize the high level of transmission there would be in an actual attack, and the importance of then having a "ring" vaccination strategy aimed at everyone in contact with an exposed subject within 3-4 days. ■

Bioterrorism Prevention Steps

► Learn more by going to www.bt.cdc.gov.
► Join the civilian volunteer Medical Reserve Corps and participate in disaster response in your community (www.medicalreservecorps.gov).
► Train and deploy with a National Disaster Medical Assistance Team (www.hhs.gov/aspr/opeo/ndms/teams/dmat.html).
► Join the active reserve corps of the U.S. Public Health Service (http://usphs-ppac.org).

Source: Dr. Lushniak