# Smallpox and bioterrorism

(NOVEMBER/DECEMBER 1999)

**TO THE EDITOR:** In his article, "The threat of bioterrorism: A reason to learn more about anthrax and smallpox" (*Cleve Clin J Med* 1999; 66:592–600; also available online at **www.ccjm.org/pdffiles/GORDON.PDF**), Dr. Steven M. Gordon offers a superb and concise synopsis of the deadly effects of smallpox on humanity. It is a virus that infected and killed the most privileged in society, such as King Louis XV of France, as well as the poorest populations around the globe. Its periodic outbreaks during the 20th century, most notably in India from 1926 to 1930, which left 423,000 people dead, provided the impetus for an all-out effort to eradicate this highly infectious disease from the world. Due to the determined and passionate efforts of Dr. Donald A. Henderson and the World Health Organization, a team of courageous doctors traveled to every corner of the world immunizing children against this lethal disease. As a result, in the United States, routine vaccination against smallpox ended in 1972. Eight years later, in 1980, the Centers for Disease Control and Prevention and the World Health Organization announced that smallpox had been eradicated throughout the world. A medical milestone, the successful elimination of smallpox remains one of the most important events of the last century.

Now, 20 years later, the world has tragically learned that the former Soviet Union during the 1980s developed the smallpox virus as a biological agent in one of its laboratories. The subsequent collapse of the Soviet Union, coupled with the political and economic chaos that ensued, heightened many people's fears that the deadly virus could fall into the malicious hands of a powerful terrorist organization. Although the virus is difficult to manufacture as a biological weapon, our country and the world cannot afford to take a chance that a smallpox outbreak could recur somewhere on earth. With the emergence of deadly viruses such as HIV, Ebola, Lassa, monkeypox, and Marburg, which modern medicine does not possess any vaccinations to stop, the prospect that smallpox could be reintroduced into human civilization should give us all pause.

The possibility—no matter how remote—that smallpox could be unleashed in the United States or elsewhere has prompted the United States to commit to the production of the smallpox vaccine as a defense against bioterrorism. However, is it enough merely to stockpile the vaccine and use it only in the event of a major outbreak? Given the highly infectious nature of the disease, trying to control and stop the spread of smallpox at the onset of an outbreak could have dire consequences. Hundreds, perhaps thousands, of people would be infected. Furthermore, the impact on our society and economy would be catastrophic. It would be prudent for us to adopt a proactive approach and begin to vaccinate our children, who are our future, and the elderly, as well as those whose immune system is weakened by disease and medications. Inoculating the most vulnerable in our society, especially in the large urban centers, would at least mitigate the deadly spread of smallpox in the event of an outbreak. It is time for us as a nation and a world to acknowledge that although smallpox could be a grave threat to our modern civilization, we do have it within our power to prevent the return of this terrible disease. It is simply a question of willpower, as well as a basic acknowledgment that too many of our fellow human beings have fallen victim to this horrific scourge.

DAVID M. HUFF
Piper, Marbury, Rudnick, & Wolfe LLP
Washington, DC

**IN REPLY:** Mr. Huff raises an interesting issue as to whether widespread vaccination of Americans against smallpox should be a strategy to prepare for a possible attack involving smallpox. Although access to smallpox (variola) virus is believed to be limited, the virus has probably been weaponized by at least three nation states (Russia, Iraq, and North Korea). Dark Winter, a tabletop exercise to assess reaction to a fictional covert smallpox attack in the United States, projected 3 million cases and 1 million deaths. This potential scenario has led others



Downloaded from www.ccjm.org on April 19, 2024. For personal use only. All other uses require permission.

to advocate reinstating routine vaccination with vaccinia (smallpox) vaccine for all US citizens.

The federal action plan for smallpox includes the stockpiling of approximately 286 million doses of cell-cultured smallpox vaccine by 2003, roughly one dose for every American (at a cost of $2.76 a dose). Recommendations regarding preexposure vaccination should be based on calculable risk assessment that considers the risk for the disease along with the benefits and risks of vaccination. The Interim Smallpox Response Plan and Guideline (**www.cdc.gov/nip/diseases/smallpox**) calls for a *contact-based* approach to vaccination after a smallpox case (or cases) has been confirmed. The reasons against reinstating routine vaccination of our population (rescinded in 1971) include:

- This live vaccine carries the risk of adverse complications, including 1 death for every million vaccinated
- The risk for smallpox occurring as a result of a deliberate release by terrorists is considered low
- Smallpox vaccine can prevent or decrease the severity of clinical disease, even when given 3 to 4 days after exposure to the smallpox virus, and experts believe that an outbreak could be contained with the same surveillance-containment strategy used in the eradication campaigns.

It is unlikely that Americans (or politicians) would tolerate the estimated 300 vaccine-related deaths to protect against a *potential* threat. The complications of vaccinia (smallpox) vaccine are significantly higher for primary (first-time) vaccinees and can be fatal for patients with immunodeficiency states, including AIDS. It is estimated that only approximately two thirds of the 1,000,000 HIV-positive Americans know they are infected with HIV. In addition, the only product currently available for treatment of smallpox vaccine complications is vaccinia immune globulin (VIG), of which stockpiles are very limited.

I cannot comment more definitively on the current risk for exposure (which is considered low), but if new intelligence indicates that the potential for an intentional release of smallpox virus has increased, preexposure vaccination might be indicated.

As for taking action after an intentional release of smallpox virus, one may take issue with the premise that an outbreak could be contained with the same surveillance-containment strategy used in the eradication campaigns. Even if one assumes there is no delay in diagnosis of the "index case," and the "push pack" arrives promptly and postrelease vaccination of persons who were exposed to the initial release of the virus occurs, I would anticipate a huge demand for vaccination from most of the "nonexposed" civilian population. By definition, a case of smallpox from an intentional release is not natural, and principles of control derived from the eradication campaign may not apply. In particular, one would have to assume that there was more than a single release, possibly involving more than one geographic area or involving several episodes spaced out over time (given an incubation period of 10 to 21 days).

In summary, unless further intelligence suggests an increased risk of smallpox exposure from terrorists attack, the current public health policy of stockpiling vaccine is probably very reasonable. Once there are adequate stockpiles of vaccine and VIG, I anticipate vigorous debate over conditions of prerelease vaccine for civilians, including the issue of whether to offer vaccine (after informed consent) to people who want to reduce their risk.

STEVEN M. GORDON, MD
Department of Infectious Diseases
The Cleveland Clinic Foundation

## SUGGESTED READING

**Noeller TP.** Biological and chemical terrorism: Recognition and management. Cleve Clin J Med 2001; 68:1001–1016.

**Pile JC, Longworth DL.** Bioterrorism: What practicing physicians can do. Cleve Clin J Med 2001; 68:998–1000.



Downloaded from www.ccjm.org on April 19, 2024. For personal use only. All other uses require permission.

# Hypothermia in a homeless man

(JANUARY 2002)

**TO THE EDITOR:** In a recent Clinical Picture (*Cleve Clin J Med* 2002; 69:62–64), Drs. Bargout and Lucas presented a case of hypothermia with typical electrocardiographic features. The patient was a homeless man brought in by the police after being found unconscious on the street, presumably in winter.

I am curious about what comes after the last sentence, "He was extubated on the following day, recovered fully, and was discharged on his 6th hospital day."

To where was he discharged? Was it back to winter's streets or was there available a short-term or long-term solution for this representative of the huge public health crisis in America? Were there even reasonable options available? If so, did the patient opt for one or decide to go back to the street for intrinsic or extrinsic reasons?

I know it wasn't the point of this informative article, but I would like to hear more.

DAVID SILVERMAN, MD
West Hartford, CT

**IN REPLY:** The patient that presented in our Clinical Picture was admitted with hypothermia. Thankfully, he recovered without incident during a short stay in the intensive care unit. However, as Dr. Silverman rightly asks, what measures were taken to prevent recurrence? Particularly, given his near-catastrophic event, were underlying causes addressed?

Homelessness is a profound social and, in turn, medical problem. On any given night in the United States, three quarters of a million people are homeless. Here in the unforgiving weather of Chicago, 15,000 people are homeless each night, according to a 1998 report from the Chicago Department of Human Services. Though the majority who seek shelters are accommodated, in 1998 an average of more than 40 people every night were denied shelter due to lack of available beds in Chicago.

The homeless are but one example of groups that have substantial health needs and suboptimal access to appropriate resources to meet these needs within our traditional medical system. We, as health care providers, are poised to address this serious problem. The genesis and perpetuation of homelessness, however, are beyond our immediate control.

Not unlike substance abuse and domestic violence, homelessness seems to always outpace our ex post facto measures. And so, unfortunately, our role has been temporizing, not curative.

We counseled our patient about the dangers of alcohol and offered him a list of available shelters with proper transportation from the hospital. Instead, he chose to return to the street.

RAED BARGOUT, MD
BRIAN P. LUCAS, MD
Cook County Hospital
Chicago, IL



Downloaded from www.ccjm.org on April 19, 2024. For personal use only. All other uses require permission.