

In Response to a Potential Bioterrorist Threat

By Steven Black, MD

Smallpox Sense

Vaccine Has Small But Significant Risks

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Immunizations are among the most widely used and effective public health measures. Many immunizations in current use, including hepatitis B, inactivated polio, and acellular pertussis have been developed to replace earlier vaccines and to provide a more acceptable safety profile. Because of the continuous safety review process and the application of new technologies in vaccine development, the vaccines we currently use routinely are more effective against more diseases yet are safer than ever. However, vaccines were not always this safe.

Smallpox vaccine or vaccinia is a vaccine that was developed initially at the end of the 18th century and was last routinely used 30 years ago. It was developed to provide protection against the dreaded risk of smallpox—a disease that killed one out of three people it infected and left most others with lifelong scars or disabilities. Because of the risks of smallpox disease and the limits of vaccine technology in the first half of the 20th century, people accepted the risks associated with routine smallpox vaccination. The risks of the vaccine were more than outweighed by the ever-present threat of smallpox. Smallpox vaccination was associated with a red, tender, crusting reaction at the vaccination site in most recipients, which lasted up to two weeks. In addition, there was a risk of more severe reactions, including overwhelming infection due

to the vaccine virus in individuals with abnormal immune systems; encephalitis or brain infection in one out of 150,000 recipients; and death in one out of 500,000 individuals. Although the risk of these severe side effects may sound relatively rare, vaccination of the entire US population would result in 600 deaths and in 2000 individuals who would develop brain infection. With smallpox not on the world scene, all of these real risks must be balanced against what is currently only a theoretical risk of smallpox being introduced by terrorists.

Apart from the risk of side effects of the current vaccine, there are other reasons not to recommend routine vaccination with the currently available vaccine. During the period when active smallpox was eradicated from the globe, the strategy used was to vaccinate individuals in a “ring” around any cases that were identified. This strategy effectively controlled and eventually eliminated infection while exposing the smallest number of people possible to the risks of vaccination. In addition, it is known that individuals exposed to smallpox can be protected against illness if they are vaccinated within a few days after exposure. Therefore, we have no need to expose the entire US population to the risks of smallpox vaccination with the current vaccine. It makes much more sense to stockpile enough vaccine to vaccinate only when and if the threat becomes real. This vaccine stockpile can serve as an effective deterrent against terrorism and buy us the time that is needed to develop a safer smallpox vaccine that could be acceptable for general use. ❖

The Ultimate Measure

The ultimate measure of a man is not where he stands in moments of comfort and convenience, but where he stands at times of challenge and controversy.

The Reverend Dr Martin Luther King, Jr, 1929-1968