

THE THREAT OF BIOTERRORISM AND THE PUBLIC HEALTH RESPONSE: SUMMARY OF THE JOHNS HOPKINS NATIONAL SYMPOSIUM ON MEDICAL AND PUBLIC HEALTH RESPONSE TO BIOTERRORISM

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As the world has grown smaller and more sophisticated, the tenets of biosafety and public health have become increasingly important. In this new age, terrorists have begun to use biologicals as a weapon, i.e., biological terrorism or the use of infectious microorganisms to dominate or coerce by intimidation, or to cause fear.

The increasing importance of bioterrorism was recently noted by Darcy Bender of the Council on Foreign Relations, Washington, DC, who described that 47 anthrax hoaxes and threats have occurred in the United States between 1992 and mid-February 1999. The majority of these incidents were not noted by either the electronic or print media.

The Centers for Disease Control and Prevention (CDC) has responded to these incidents by publishing response guidelines to these threats (CDC, 1999) in a report in the *Morbidity and Mortality Weekly Report (MMWR)* entitled *Bioterrorism Alleging Use of Anthrax and Interim Guidelines for Management - United States, 1998*. This article supplemented an earlier paper by Kaufmann and co-workers (Kaufmann, et al., 1997) who provided economic justification for developing preparedness programs to bioterrorist incidents and discussed the impact of three biological warfare agents.

This rise in interest in bioterrorism was reflected by the one thousand people who registered to attend the Johns Hopkins National Symposium on Medical and Public Health Response to Bioterrorism in February, 1999. Attendees came from many walks of life; biological safety professionals, emergency response experts, health care providers, hospital administrators, government officials, hospital epidemiologists, intelligence experts, law enforcement officials, microbiologists, military experts, nurses, physicians, public health officials, public policy analysts, and of course the media. The Johns Hopkins University Center for Civilian Biodefense Studies sponsored

this symposium in association with the U.S. Department of Health and Human Services, the Infectious Diseases Society of America, and the American Society for Microbiology. Co-sponsors were the American College of Preventative Medicine, the Association of Public Health Laboratories, the Association of Schools of Public Health, the Association of State and Territorial Health Officials, the Commissioned Officers Association of the U.S. Public Health Service, the Council of State and Territorial Epidemiologists, the National Association of County and City Health Officials, the National Association of Local Boards of Health, the Partnership for Prevention, the Public Health Foundation, and the Society of Healthcare Epidemiologists of America. Proceedings of the symposium are netcast at the Johns Hopkins Civilian Biodefense website:
<http://www.hopkins-biodefense.org>.

Reality of the Threat

D. A. Henderson, Director of the Johns Hopkins Center for Civilian Biodefense Studies, began the symposium by introducing the keynote speaker, Ms. Donna Shalala, Secretary of Health and Human Services. Ms. Shalala noted that public health and medical personnel are the lead groups in responding to bioterrorism incidents. Additionally, she discussed the Administration's commitment to providing financial and personnel resources to assist in developing response plans.

David Siegrist, Potomac Institute for Policy Studies, pointed out that the presence of vulnerable targets and the willingness of terrorists to use biological weapons has obviously heightened concerns about bioterrorism. He further described biological weapon caches that had been left by the allied forces at the conclusion of operation Desert Storm due to fears that destruction of these weapons could cause collateral damage (civilian casualties).

Russia and Iraq

Christopher Davis, Director of the ORAQ Consultancy, called the attention of the audience to the lack of involvement of healthcare workers in response planning to bioterrorist events. He went on to discuss that the government's awareness of biological terrorism was the result of the discovery of a secret Soviet bioweapons program at the time of the Gulf War.

Domestic Terrorism

Jessica Stern, former National Security Council member and Fellow of the Council on Foreign Relations, discussed the assumption on the part of the public that terrorists would not attempt to use biological weapons out of fear of reprisals by the country in which the attack occurred. However, she indicated that this may not be a sufficient deterrent if the attacks are carried out by individuals or groups which are not directly connected with specific countries.

Aum Shinrikyo

Kyle Olson, Research Planning, Inc., described the sarin chemical attack by Aum Shinrikyo that involved the simultaneous release of the gas in five trains heading toward downtown Tokyo. He reviewed the cultural background of the terrorist organizers and their legitimization of the attack as a response to the threat of a police raid on their headquarters.

BIOLOGICAL AGENTS OF HIGHEST CONCERN

Introduction

Joshua Lederberg, Professor and President Emeritus of Rockefeller University, pointed out the threat of bioterrorist attacks against livestock and crops with the resulting disruption of the nations' food supply.

Creating the Threat List

Gerald Parker, Director of the U.S. Army Medical Research Institute of Infectious Diseases, discussed the NATO list of bioterrorist weapons and outlined the requirements for an effective biological weapon, including; availability, lethality, stability, infectivity, and its ability to be delivered by aerosolization. In this regard, he described, in decreasing importance, anthrax spores, smallpox virus, plague bacteria, tularemia bacteria, botulinum toxin, and encephalitis viruses as potential biological weapons. Additionally, he

discussed the possible use of etiologic agents of fungal crop diseases, i.e., wheat stem rust, rye stem rust, and rice rust, as potentially effective weapons.

Epidemiology of Bioterrorism

Julie Pavlin, Chief of Field Studies of the Walter Reed Army Institute of Research, discussed disease outbreaks caused by well known pathogens that would be difficult to identify if there were spontaneous outbreaks, bioterrorist attacks, or laboratory accidents. The importance of verifying the identification of the etiologic agents, development of case definitions, and the use of epidemiological approaches to establish the sources of such outbreaks was emphasized. Indicators of bioterrorist attacks may include: large numbers of acutely ill patients, higher than usual death rates, increased respiratory disease, infections that are unusual for a particular part of the world, information from intelligence sources, the presence of multiple epidemics, unexplained numbers of dead animals, and/or direct evidence such as claims by aggressor groups. She concluded by reiterating that bioterrorist attacks are not incidents that should be managed by first responders.

Clinical and Epidemiological Principles of Smallpox

D. A. Henderson presented information about smallpox and the causative virus. He noted that while possibly treatable with individuals receiving vaccination within 2 to 3 days of exposure, the clinical rash symptoms do not develop until 12 to 14 days after exposure. There is no current production of smallpox vaccine and the time required to produce a new recombinant vaccine is approximately 2 years.

Clinical and Epidemiological Principles of Anthrax

Edward Eitzen, Chief of Operational Medicine at the U.S. Army Medical Research Institute of Infectious Disease, discussed anthrax, pointing out that it is an animal disease usually transmitted to humans by contact with animal fluids, hair, wool, bone, or by ingestion or inhalation of the bacterial spores. The ID₅₀ of anthrax is 8,000 to 10,000 spores, as compared to an ID₅₀ of 10 for tularemia or 1 for Q-fever. However, he noted that 100 pounds of spores released in a city of 500,000 could kill 150,000 people in 3 to 4 days.

Anthrax: A Possible Case History

Thomas Inglesby, Fellow at the Johns Hopkins Center for Civilian Biodefense Studies, presented the clinical symptoms of anthrax disease and went on to describe a scenario involving the use of a truck to release 100 pounds of anthrax spores as an aerosol while driving by a football stadium during a game. He pointed out that within 2 days of exposure, people would begin to develop flu-like symptoms. Three days later, when the outbreak is diagnosed as anthrax, one quarter of those exposed may have died. Six days post-exposure, large quantities of antibiotics would arrive at the site of the incident to treat those exposed. Epidemiological investigations would redefine case descriptions to include individuals that were not in the vicinity of the football stadium, because the spores could be carried downwind for upwards of 260 kilometers. He described such a release of anthrax spores that occurred in the Soviet Union in 1979, resulting in 77 cases and 66 deaths.

The Administrations' Response

Richard Clarke, National Coordinator of Security, Infrastructure Protection and Counter-Terrorism at the National Security Council, described the President's response program to bioterrorism. Five years ago, the President asked the National Security Council to investigate asymmetric threats to the United States involving rogue individuals or nations using chemical or biological weapons. The possibility of such an attack was heightened by the discovery of the Soviet Union's extensive biological weapons production program, even though it was a signatory to the chemical and biological weapon nonproliferation treaty of the early 1970's. He pointed out that although the administration has no knowledge of a specific group that is planning to attack with biological weapons, if such an attack were to occur, the country would not be able to respond quickly with crash research or mass vaccination or antibiotic therapy programs. Therefore, the administration's current budgeting directive will fund the stockpiling of medicines for civilian protection, research and development programs for new vaccines and medicines, pathogen-genome sequencing studies, and the creation of improved diagnostic methods. Additionally, significant funding has been allocated for local public health infrastructure, including

training for physicians to heighten their awareness of the signs and symptoms caused by biological weapons. The ultimate objective is to have a biological weapon defense program that is so well organized that it will act as a deterrent to any group planning such an attack.

Smallpox: A Possible Case History

Tara O'Toole, Senior Fellow of the Johns Hopkins Center for Civilian Biodefense Studies, presented a scenario involving exposure of people in a large room to an aerosol release of the smallpox virus. Fourteen days after this silent biological attack, the targeted individuals would develop flu-like symptoms and seek medical attention. There was a consensus that differentiation of the illness from chickenpox or other related infectious diseases could take up to 18 to 20 days after the attack. Discussion also included the advisability of preventing hospital staff, who may have been exposed to infectious patients, from leaving a hospital. Many attendees thought that the hospital staff would flee unless there was a respected hospital spokesperson that could communicate with the staff and provide a planned preventative course of action that would provide healthcare workers with significant protection from the transmission of the disease.

Panel Discussions

Panel and audience discussions ensued concerning such issues related to the smallpox case history as; (i) the authority that assumes command of an incident involving this infectious disease, (ii) the potential role of the media to decrease public fears and direct health care professionals to assist in the incident, (iii) the role of public health institutions and the services that they could provide in the care and treatment of the target population, and (iv) the stockpiling of vaccines and antibiotics in preparation for terrorist incidents.

The symposium ended with panel discussions of events that may occur as an epidemic caused by a bioterrorist attack extends across the country. John Bartlett, Chief of Infectious Diseases at Johns Hopkins, described the lessons learned from other scenarios, and Margaret Hamburg, Assistant Secretary for Planning and Evaluation, HHS, presented concluding remarks on the potential future directions for preparing for bioterrorist incidents.

ACKNOWLEDGEMENT

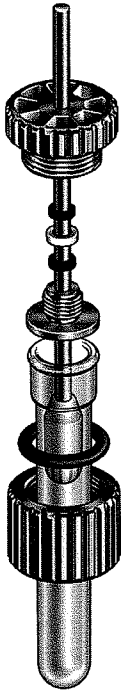
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