

Biological terrorism: a perspective for GPs

GORDIAN FULDE

MB BS, FRACS, FRCS(Ed), FRCS/RCP(A&E)Ed, FACEM

The last of a series of articles about the roles general practitioners could play after a chemical, biological or radiological incident covers the the initial detection of an incident involving a biological agent and the issue of prophylaxis for doctors and other healthcare workers.



The generation of fear and panic and the disruption of the normal functioning of society are two of the main aims of terrorism, and hence chemical, biological and radiological (CBR) incidents are as likely to be directed at civilian populations as at military populations. Hospitals may even be targets. If an incident occurs, it will be essential to preserve and protect the health of doctors and other healthcare workers so that local hospitals can continue to function.

GPs will probably have a greater role in detecting biological incidents than chemical or radiological incidents as biological agents will generally not have immediate effects because of the incubation period of the disease caused by the infectious agent.

This article concentrates on the initial detection of the use of a biological agent in terrorism, mentioning briefly the biological agents that have potential for use in such situations, and also ways in which GPs can protect themselves against these agents. The first article in this series covered the GP's role in disaster response and triage, and the second, terrorism using chemical and radiological agents (*Medicine Today* 2003; 4(9): 62-64 and (10): 63-65, respectively).

Biological agents

Many biological agents have the potential for use in warfare or, as is probably more likely nowadays, bioterrorism. These agents cause diseases of differing severity and have different modes of spread and different infectivities and stabilities. Toxins derived from bacteria or plants, such as *Clostridium botulinum* toxin and the castor bean (*Ricinus communis*) toxin, ricin, are included in the biological agents category.

The US Centers for Disease Control and Prevention (CDC) has classified potential bioterrorism agents on the basis of disease severity, ease of spread and potential for causing disruption and panic, with category A agents being those that would cause the greatest damage

(Table 1).¹ *Bacillus anthracis* (anthrax), variola virus (smallpox), *Yersinia pestis* (pneumonic plague), haemorrhagic fever viruses (Ebola, Marburg and Lassa fevers) and *C. botulinum* toxin are examples of

Table 1. Outcomes of infection with some bioterrorism agents¹

Fatal outcome (CDC category A agents)

- *Bacillus anthracis* (anthrax)
- Variola virus (smallpox)
- Ebola virus, Marburg virus, Lassa virus (viral haemorrhagic fevers)
- *Yersinia pestis* (pneumonic plague)
- *Clostridium botulinum* (botulinum toxin)

Disabling outcome (CDC category B agents)

- *Salmonella* spp. (salmonellosis)
- *Shigella* spp. (shigellosis)
- *Rickettsia prowazekii* (typhus fever)
- *Coxiella burnetii* (Q fever)
- Alpha and flaviviruses, e.g. Venezuelan, Eastern and Western equine viruses and Japanese encephalitis virus (viral encephalitis)

CDC = Centers for Disease Control and Prevention, USA.

Professor Fulde is Director, Emergency Department, St Vincent's Hospital; Associate Professor in Emergency Medicine at the University of New South Wales, Sydney, NSW; and Senior Medical Commander, NSW Department of Health.

Table 2. Bioterrorism: initial presentations and possible causes³**Nonspecific fever**

Anthrax, plague, smallpox, Q fever

Fever, rapidly progressed to septic shock

Anthrax, plague, viral haemorrhagic fever

Respiratory symptoms, fever, cough, pain, shortness of breath

Anthrax, plague

Neurological fits, coma

Japanese encephalitis

Paralysis

Botulism

Skin lesions, pustulovesicular or haemorrhagic

Smallpox, viral haemorrhagic fever

category A agents. Category B agents include *Rickettsia prowazekii* (typhus fever), *Coxiella burnetii* (Q fever), certain encephalitis-causing viruses and ricin. Other category B agents, and of higher concern, are those that could be used to contaminate food and water supplies, such as *Salmonella* and *Shigella* species, *Escherichia coli*, *Vibrio cholerae* and *Cryptosporidium parvum*.

Initial detection of an incident

The deliberate release of a biological agent in a military scenario is likely to be readily detected because many people will become ill with similar symptoms at the same time. The initial detection of a similar attack in a civilian population may be less obvious, unless the incubation period is short, because affected individuals may live in widely dispersed areas and present to different GPs. Notwithstanding this, GPs are well placed to notice changes in

disease among their patient population that might indicate the release of a biological agent. Epidemiological clues to the deliberate release of a biological agent comprise the following:²

- rapidly increasing disease incidence in healthy individuals
- epidemic curve that rises and falls in a short time
- uncharacteristic timing of local or common disease
- clusters of patients
- increased fatalities
- uncommon disease; presentation possibly due to a bioterrorism agent.

Many biological agents that might be used in bioterrorism cause, at least in the early stages, symptoms consistent with those of many common illnesses (Table 2).³ A GP's suspicions will probably be aroused by one or several cases of atypical presentation among his or her patients. These cases will probably be later confirmed to have been as suspected by sophisticated diagnostics such as polymerase chain reaction tests.

Detecting an act of bioterrorism is basically an extension of normal clinical practice. It is important to balance awareness and suspicion of a rare event against the low probability of the rare event occurring and overreaction or panic.

Details of the various biological agents and disease diagnosis and treatment are beyond the scope of this article. Local public health authorities are trained to help with these issues.

Prophylaxis for GPs

The protecting of GPs and others involved in the initial response to a bioterrorism incident is controversial and, in the end, a personal risk analysis decision. Should GPs keep stocks of doxycycline and ciprofloxacin (potential curative therapy for most treatable bioterrorism agents) for themselves and their loved ones – and their patients?

Prophylaxis is recommended for those exposed to an agent but not for healthcare

CBR terrorism information websites**Association for Professionals in Infection Control and Epidemiology**www.apic.org/bioterror

Contains biological agent fact sheets, bioterrorism readiness plan for health care facilities, disaster plan checklist and information on historical trends, epidemiology and vaccines.

Centers for Disease Control and Preventionwww.bt.cdc.gov/

Details the Centers for Disease Control and Prevention's plan for addressing infectious disease threats and enhancing the public health information infrastructure and bioterrorism preparedness.

Centers for the Study of Bioterrorism (CSB) and Emerging Infections (CSEI)www.slu.edu/colleges/sph/bioterrorism/ and www.emerginginfections.slu.edu/

A St Louis University site that provides public health and health care facilities with information regarding preparedness and response to the intentional use of biological agents and emerging infections.

World Health Organizationwww.who.int/csr/deliberatedemics/en/

Contains resources related to communicable disease surveillance and response.

American College of Physicianswww.acponline.org/bioterror/

Provides information to practising physicians regarding biological terrorism.

workers treating the patient unless the agent is transmissible (such as smallpox and pneumonic plague).

Smallpox vaccine, a live vaccine, has a definite side effect profile (for example, it is contagious by contact to broken skin) and is not to be used in immunocompromised patients, such as those with cancer or HIV, or those taking steroids. Smallpox vaccination is generally only recommended for those at high risk, such as military or emergency doctors who may be part of a response team or may have to treat cases. Although older doctors and older members of the general population may have had smallpox vaccinations when they were young, it is unlikely that they still have effective immunity. However, past immunity may well lessen the severity of the disease should it be contracted. Also, different strains are likely to be involved.

Conclusion

GPs are well placed to detect the epidemiological indicators of a deliberate release of a biological agent although awareness and suspicion of a bioterrorism incident have to be balanced against the low probability of such an event occurring. Prophylaxis for GPs and other healthcare workers is a controversial issue. **MT**

References

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Further reading

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