Journal of Bioterrorism & Biodefense
ISSN: 2157-2526
Balali-Mood M, Moshiri M, J Bioterror Biodef 2014, 6:1
DOI: 10.4127/2157-2526.1000e113

Editorial Open Access

Problems of Clinical Diagnosis and Management of a Deliberate Biological Born Disease

Mahdi Balali-Mood[*1] **and Mohammad Moshiri**[2,3]

[1]*Director, Medical Toxicology Research Centre, Mashhad University of Medical Sciences, Iran*

[2]*Department of Pharmacodynamy and Toxicology, School of Pharmacy, Mashhad University of Medical Science, Mashhad, Iran*

[3]*Health insurance research office, Armed forces insurance organization of Islamic Republic of Iran, Tehran, Iran*

[*]**Corresponding author:** Mahdi Balali-Mood, Director, Medical Toxicology Research Centre, Imam Reza Hospital, Faculty of Medicine, Mashhad University of Medical Sciences ,Mashhad , Iran; Tel: + 98-511-8819301, 98-9151157000; Fax:+ 98-511-8002467/8591057; E-mail: Mahdi.Balali-Mood@ncl.ac.uk

Received date: September 3, 2014, **Accepted date:** September 4, 2014, **Published date:** September 8, 2014

Keywords: Biological warfare agent; Bio toxin; Bioterrorism; Clinical diagnosis; Management; Treatment.

Editorial

Biological warfare agents (BWA) have a large spectrum. They include some natural or genetically modified bacteria, viruses, rickettsia, fungi and biological toxins [1,2]. Some particular BWA can cause deterioration of materials, e.g., petroleum-eating bacteria [1].

Center for Disease Control and Prevention (CDC) of the United States has categorized BWA based on the risk to national security, into three categories of A, B and C [3]. The A group are highly toxic that pose a major risk to national security. They include: **Anthrax** (*Bacillus anthracis*), **Plague** (*Yersinia pestis*), **Tularemia** (*Francisella tularensis*) and **Botulism** (*Clostridium botulinum* toxins). The B category consists of biological agents or bio toxins whit different characteristics, ranging from a highly toxic such as ricin, to a low hazardous like staphylococcus bacteria [1,3]. The C category which is called future weapon is bio-engineering made toxins [1,3].

BWA have some special properties which attract the terrorists and military services to use them as a weapon. BWA are generally easier to access and storage and less equipment's for delivery than chemical warfare agents (CWA) [4]. The other important characteristic of BWA is the delay in onset of clinical symptoms resulting in an incubation period [5]. The incubation periods of different agents are various from hours for Ricin, to a few days, for anthrax or plaque. This makes problems for diagnosis of source of disaster and finding the culprit.

BWA particularly bio toxins like botulinum and ricin are the most deadly weapons that may not initially be diagnosed. Very low concentration of some BWA on the environment or in organisms complicates detection of the agents. The odorless and colorless of most BWA should also be added to their detection problem lists [6].

Some BWA, such as plague and smallpox, can fast spread to large population resulting in epidemics and sometime pandemics [7]. The spreading velocity complicates the management and control of BWA induced disaster, especial in sensitive population.

Some of BWA such as smallpox or measles are almost eradicated in the world. The spreading of these kinds of BWA in sensitive people induces the fast epidemic disaster due to the sensitivity of population to these viruses and lack of readiness of health services (HS) may induces problems in clinical diagnosis and management of the patients [8].

One important considerable factor about applying a BWA for the population is the induce diseases which should be difficult to detect and are very similar to common and/or endemic infections [7]. Besides, majority of BWA are traditionally known organisms or toxins that may not be of interest for the new generation of health professionals and thus may not be their first diagnosis and the BWA widespread without appropriate clinical management of the patients [8].

In contrast the other warfare agents, BWA could apply in variant routes, as oral, inhalation, injection, and even dermal contact. The food and water can easily be contaminated by BWA. Moreover, in contrast to the other warfare agents, BWA could be disseminated by several equipment's, not only by explosive devices such artillery and missiles but also by everything such as furniture's and or letters. This is a detection dilemma of BWA for HS [1,2].

Detection of BWA is a problem for HS. However, there are several easy methods for detection of BWA, but most of them are not available in majority of laboratories, particularly in developing countries. Furthermore, the available detectors could detect only some of BWA, but not all of them [4].

The BWA intoxication may be initially diagnosed based on clinical manifestations in a group of patients. Unusual sudden occurring symptoms in a large number of healthy soldiers might be a suspicion for BWA use. The high fatality rate of some BWA in human and animals and presence of unusual environmental events such as yellow rain are also associated with the application of BWA [9].

Fast detection of BWA and isolation of infected or intoxicated victims are the first steps on the management plan of BWAs. We recommend the followings for HS and security authorities to reduce the risk of BWA attacks.

a) The security and health professionals should be aware of the risk of BWA and be prepared for prompt actions as required.

b) Increasing the knowledge of clinicians and other members of HS, can reduce the harms of victims of a bioterrorist attack. Fast BWA detection improves clinical management of the patients.

c) Establishment and Improving the knowledge and equipment of the rapid response teams of BWA in all HS.

d) Conduct BWA simulation exercises for HS and or military health service to increase knowledge, cooperation and response of their team members.

e) Prepare regional guidelines for a possible BWA incident based on HS ability and potency of equipment's, medicines and regional distributions.

f) Active vaccination for population at risk including the military personnel, emergency first responders, laboratory workers and also for very important or diplomatic individuals at high assassination risk.

Conclusion

BWA and bio toxins are very wide and bioterrorism is a heath and security threat that may induce national and international problems. Therefore, the security authorities, health professional and even public should be aware and be prepared for a biological war or bioterrorism.

References

1. Balali Mood M, Moshiri M, Etemad L(2014) Biological warfare, Bio warfare and terrorism: Toxins and other mid-spectrum agents, in Wexler, P et al. : Encyclopedia of Toxicology 3rd Edition, Elsevier, Amsterdam : 503-508.
2. Balali-Mood M, Moshiri M, Etemad L (2013) Medical Aspects of Bio-Terrorism, Toxicon, 69: 131-142.
3. Centers for Disease Control and Prevention (CDC) (2012), Emergency Preparedness and Response, Bioterrorism Agents/Diseases.
4. Cosgrove SE, Perl TM, Song X, Sisson SD (2005) Ability of physicians to diagnose and manage illness due to category A bioterrorism agents. Arch Intern Med. 165: 2002-2006.
5. Khardori N(2006) Bioterrorism Preparedness Medicine - Public Health - Policy, WILEY-VCH Verlag GmbH & Co. KGaA, Weinheim: Mçrlenbach, Germany: 1-33.
6. Gustin JF (2005) Bioterrorism: A guide for facility managers : CRC press, London.
7. Khardori N (2006)Bioterrorism and bioterrorism preparedness: historical perspective and overview. Infect Dis Clin North Am. 20: 179-211.
8. Switala CA, Coren J, Filipetto FA, Gaughan JP, Ciervo CA (2011) Bioterrorism--a health emergency: do physicians believe there is a threat and are they prepared for it? Am J Disaster Med. 6: 143-52.
9. Moshiri M , Etemad L, Balali- Mood M (2014) Ricin a review, in Gopalakrishnakone P (Ed): Handbooks of Toxicology. Biological Toxins and Bioterrorism, Springer (in press).