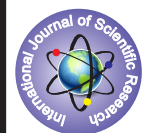


## BIOTERRORISM: AN EMERGING THREAT TO HUMANITY



### Nursing

#### KEYWORDS:

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### ABSTRACT

Biological warfare has been existing since ancient times. Biological agents can be spread through the air, water, or in food. Terrorists tend to use biological agents because they are extremely difficult to detect and do not cause illness for several hours to several days. Some bioterrorism agents like the smallpox virus can be spread from person to person and some like Anthrax, cannot.

### INTRODUCTION

According to the U.S. Centers for Disease Control and Prevention Bioterrorism is the deliberate release of viruses, bacteria, toxins or other harmful agents to cause illness or death in people, animals, or plants. These agents are typically found in nature, but could be mutated or altered to increase their ability to cause disease, make them resistant to current medicines, or to increase their ability to be spread into the environment.

Outbreak of plague, Smallpox, Cholera, influenza has played a major role in decimating human populations. Such catastrophes were described as 'Evil Sprits', Wrath of God, deserving retribution to evil ways.

In due course of time, it was realized that they were due to infectious agents. That tempted the conquerors to use such infectious agents as military weapons to cause social paralysis. There are accounts of using diverse noxious substances like feces, dead horses, gas etc. as weapon but not successful.

### HISTORICAL BACKGROUND

Biological warfare seems to have been existing since 600 BC when Roman Generals poisoned water used by enemy, by dumping rotting animal carcasses. In Scythia (400 BC) arrows were used dipped in blood, manure or decomposing bodies and targeted at water supplies of the enemies. Members of religious cult (1984) in Dalas, Oregon, contaminated salads in restaurant with *Salmonella typhimurium* in an attempt to influence the result of elections. In the recent past Anthrax contaminated letters were posted to politicians. With the advancement in techniques, genetic manipulations, delivery systems, the threat of biological warfare is more eminent today, not only aiming at human enemies but also towards live stocks and crops to produce economic loss.

Biological weapons are called as 'Poor Man's Atomic Bomb' as their production cost is low.

### EVOLUTION OF CHEMICAL AND BIOLOGICAL WEAPONS

- *Phase I:* Gaseous chemicals like Chlorine and Phosgene were used in World War I.
- *Phase II:* Use of Nerve agents- Tabun, and beginning of Anthrax and Plague in World War II.
- *Phase III:* Herbicides were used to cause crop destruction.
- *Phase IV:* In recent times, biotechnological and genetic engineering revolutions are in progress.

### MERITS

- Low cost: poor man's atomic bomb.
- Large quantities can be produced in short time with minimum facilities.
- Non detection by security scan system.
- Very toxic, hence small quantities will kill large number of people.

### DEMERITS

- Difficulty for protecting workers during production,

transportation and delivery.

- Difficulty in maintaining quality control, contamination during growth and harvesting.
- May be destroyed after delivery.
- Need specific conditions for storage, hence difficult to maintain in weapons.
- May disperse in unexpected ways aided by the wind. Difficult to control once released.

### TOP BIOLOGICAL WEAPONS

- *Bacillus anthracis:* causes pulmonary anthrax in humans.
- *Yersinia pestis:* results in Plague a disease of rodents.
- *Smallpox virus:* also called variola virus causes smallpox in humans.
- *Clostridium botulinum:* the bacilli release an endotoxin, a powerful neurotoxin resulting in a condition called botulism characterized by paralysis of parasympathetic system.
- *Vibrio cholera:* cause gastroenteritis.
- *Ebola virus:* a highly contagious virus resulting in conjunctival hemorrhage and multiorgan failure.
- *Mycotoxin:* a toxic product of fungi which contaminates grains and agriculture products resulting in diseases.
- *Newer trends:* products of microbes that can kill or incapacitate targeted hosts, eg. Hormones, Neuropeptides and cytokines called as designer substances to target a particular organ or a type of enemy.

### DELIVERY OF BIOLOGICAL WEAPONS

- Scud missiles
- Motor vehicle with spray
- Hand pump sprayers
- By an individual
- Book or letter
- Guns
- Remote control devices
- Robotic delivery

### COMBATING BIOLOGICAL WEAPONS INCIDENT/AT RISK GROUP

The first responders are physicians, infectious disease specialists, epidemiologists, hospital and public health administrators and laboratory experts.

#### Steps to be taken:

- *Detection:* a microbiologic confirmation is needed.
- *Case definition:* to be formulated by health care personnel.
- *Notification:* to proper civilian and military authorities.
- *Differentiation* between natural and terrorist warfare
- *Investigation:* a quick identification of the sources and consequences of the outbreak.
- *Medical intervention:* diagnosis, intervention and treatment.
- *Prophylaxis:* immunization of health care professionals and contacts- actively or passively.
- *Public awareness:* it needs to be created to ensure that the incident does not turn into public hysteria.

**FUTURE SUGGESTIONS:**

- To create awareness among the public and doctors.
- To stock pile drugs and vaccine.
- Allocation of separate funds.
- International collaboration is required.
- Microbiologists are the main focal point of action because the biological weapons are the products of their specialty.

**CONCLUSION**

Biological weapons are unique in their invisibility and their delayed effects. These factors allow those who use them to inculcate fear and cause confusion among their victims and to escape undetected. Because of the increased threat of terrorism, the risk posed by various microorganisms as biological weapons needs to be evaluated. Government agencies which would be called on to respond to a bioterrorism incident would include law enforcement, hazardous materials/decontamination units and emergency medical units, if they exist. Biowarfare attacks are now a possibility. The medical community as well as the public should become familiar with epidemiology and control measures to increase the likelihood of a calm and reasoned response if an outbreak should occur.

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