

Bioterrorism: a Medical Student's Perspective

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Are we better off today than we were a century ago? In most respects, we were worse off. For instance, we have been neglectful of the microbes and they are coming back to haunt us with a new name called “bioterrorism” or “biological warfare”.

Biological weapons are agents whose intended target effects are due to the infectivity of disease-causing microorganisms and other replicative entities, including viruses, infectious nucleic acids and prions¹. In the wake of the recent anthrax cases in the United States, many questions have arisen and many concerned organizations are being unveiled. Viewed from an ostensible perspective, the whole scenario implores us to lay emphasis on establishing coherent policies and improving current surveillance systems to handle such an incident². The ‘fragmented, under-funded and vulnerable’ public health system of many a nation is being focussed and physicians, nurses and emergency medical technicians are undergoing training and preparedness drills³. Improvement in forensic investigation and clinical laboratory facilities especially those affiliated with major trauma centers, as availability of reliable diagnostic tests for detection and identification of specific agents^{4,5} has become an essential pre-requisite. It has also become imperative for every medical personnel to have a reliable approach for early identification and management of a patient, suspected of being a victim of such an attack.

As a medical student and a future doctor it is imperative that I understand the behavior, pathogenesis, mode of transmission, physiological effects, diagnostic modalities and available treatment options. But, if I look at these pathogens and poisons from a ‘bioterrorism’ point of view my academic and clinical knowledge lags like my senior colleagues. I have to have a special training to be on a lookout for unusual cases or cluster of cases with identical signs and symptoms that may be the first indication of a biological attack—a strategy called “syndromic surveillance^{6,7}”. I should also have to be informed about the preventive measures and precautions that I need to take so that I may be able to prevent casualties. Moreover, I should be aware of the concept of “sociogenic illness” which highlights the psychological impact of chemical and biological weapon on the population⁸. This will be a requirement for me in the future and the doctors in the hospitals today should have been already prepared with these above mentioned skills.

So what is my task? The missing piece of the puzzle for me is not only to find ways to hone my clinical skills but also to convince my mentors to improve the technology and work for advancement in science and medicine. We can start focussing on developing effective immunization techniques against infectious pathogens. Vaccines to me offer the greatest opportunity to reduce the number of deaths caused by these agents. There is a strong need of new types of vaccines that not only are potent overall, but also induce either a stronger humoral response or a cell-mediated response. The world has given us a lead, recently scientists have been able to develop an antibiotic for the Plague by mapping all the genes in the plague bacterium, namely *Yersinia pestis*⁹. Knowledge of gene sequences should provide a catalogue of the genes that code for every virulence factor and potential immunogens, either as target for neutralizing antibodies on the basis of their structural characteristics or as a source of T-cell epitopes¹⁰. We can secure our future by focussing on genetic research. The medical field has wasted a lot of time and effort and of-course money in probing into ethically disputed issues such as cloning humans, producing smart babies, euthanasia and corrupt medical practices. We have overlooked the creatures and poisons that we are now facing as our predators. While the human race battles itself, fighting over ever-scarcer resources, the advantages have moved to the microbes’ court. Should we just

wait and see or should we do something about it?

References

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