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Contemporary Issue

Bio-threat preparedness: Need for a paradigm shift

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ABSTRACT

India of late has been vulnerable to Chemical, Biological, Radiological and Nuclear (CBRN) threat, on account of its unique geographic position. Biological threat is an imminent threat in the hands of a terrorist. The public health system of our country is overburdened due to its present role and bio-attack response is not a priority area. This paper suggests that as the prime focus is on the CR and N threats in the integrated CBRN preparedness strategy and that specialized and technical forces are needed to deal with a bio-threat; hence there is a need for a paradigm shift in policy. The emerging field of bio-threat needs to be delinked from the joint family of 'CBRN', with consequent structural and functional changes. A separate specialized cadre needs to be formed for dealing with bio-threat, created from the pool of doctors and non-medical scientists from the AFMS and the DRDO. Structural changes are needed in the organization, to bring in the resources of NCDC, New Delhi for enhanced disease surveillance capacity and creation of a bio-threat mitigation node in the AFMC, Pune.

Introduction

India, like most other countries in the world, has of late been vulnerable to Chemical, Biological, Radiological and Nuclear (CBRN) threat, on account of its unique geographic position.[1,2] The scale of damage done by these weapons of mass destruction is undoubtedly huge. Nuclear weapons are likely to be the most catastrophic and regardless of our preparedness will wipe out a significant number of our economic assets and population within microseconds of its impact. However, the good part is that it is unlikely to be used in war due to widespread international repercussions thereafter. A terrorist can of course use it, but he needs a lot of preparation and sophisticated delivery mechanism to put it into practice.

Non-persistent chemical weapons do have the potential to be used in warfare because countries can easily deny it's use and get away with it. The good part here is that our Armed Forces are geared up to handle this issue in both war and peace. A large number of exercises have taken place wherein the scenario of a "chemical attack" has been painted and our Quick Reaction Teams (QRTs), Quick Reaction Medical Teams (QRMTs) and hospitals have by their performance instilled confidence in us, that they can do the job during actual operations.

This takes us to the third dimension viz Biological threat mitigation. It is highly unlikely to be an option in war as the country using it will fear that its own troops might get affected. However, the risk of a terrorist organization using it is very real.[3] His capability to acquire, cultivate and disseminate pathogens is widespread. Well documented bio-agent attacks are present in the recent past, like the salmonella released in salads in a restaurant of Oregaon, USA, 1984[4] and

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anthrax spores filled letters of 2001, which resulted in the death of five persons in USA.[5] Seth Carus has stated "pound for pound, biological weapons are potentially more lethal than thermonuclear warheads."[6] WHO has estimated that "50 Kg of anthrax spores released over a city of half million people would kill 95,000 and incapacitate 125,000".[7]

These predictions are based on a non-contagious agent. With use of a contagious agent, like small pox, the disease could spread to several areas in a matter of hours and would become a worldwide pandemic within days, due to the mobility of our societies. The public health system of our country which is stretched due to diverse requirements and roles was slow to respond to bio-threat, during the plague outbreak in 1995.[8]

This is because there were multiple agencies with ill defined and generalized roles both in civil and the forces, resulting in lack of clarity and coordination. This paper suggests that the present integrated CBRN preparedness strategy being more focused on CR and N leaves us grossly unprepared to tackle a bio-threat. There is a need of a paradigm shift in policy to delink the now emerging Big 'B' from the joint family of 'CBRN', with consequent structural and functional changes, so that we are capable of taking on the bio-threat head on.

Rationale for paradigm shift

For managing any CBRN disaster, preparedness, prevention, mitigation and capacity building are the integral pillars of the response process. With the rise in the threat perception, progress has been made in leaps and bounds in the field of mitigation. But this is generally limited to the nuclear, chemical and the recently added radiological field. The place of 'B' in this integrated fit has been limited to classroom teaching.

There are polices and guidelines in place.[9,10] However, priority is often allocated to nuclear and chemical threat perception and hence implementation of these guidelines takes a relative backseat. This could be due to the fact that unlike chemical and nuclear disasters that cause immediate casualties, bio-threat is essentially a slow developing emergency. The response operation against a bio-threat is heavily manpower intensive and requires extraordinary assistance from other agencies. A multi-dentate network involving diverse agencies of health along with a dedicated communication network is the need of the hour.

QRMTs have been identified, trained and positioned at the Corps level but the dual tasking of these personnel and insufficient equipment, defeats the very essence of the structure. Earmarked hospitals are authorized a crisis expansion ward but the trained manpower and specialized logistics is generally lacking.

Personal protection, early detection, vaccination and antidote administration are the special requirement for management of any biological casualty. But in the past few years, hardly any new product has been introduced to combat these bio-threats. To compound the problem, the production line for new drugs and equipment has also run dry.[11] Bio-threat mitigation equipments are still limited to the First Aid Kit Type A and B.

Let us take a few examples. The present bulky NBC suit worn by the first responder, is inadequate to manage any biological warfare casualty in the field, as the skilled operations are restricted and it also subjects the wearer to heat stress. Some improvement has been made by reducing the weight of the suits to less than 4 kg. This needs to be made available to the soldier on ground. Further, it is expected that epidemic investigation teams, launched on report of an unusual incidence of a disease will wear this suit, even when there is no nuclear or chemical threat envisaged. They need a lighter bio-suit for field conditions. Having said that, it is to be conceded that it is unlikely that the conventional Sartoga NBC suit will be worn in a bio-threat scenario, as bio-warfare casualties do not manifest in an emergency. However, the twenty one basic survival drills taught to the troops and first responders, are exhausted with the nuclear and chemical protection, but do not speak on bio-threat protection, as it is considered a specialized subject.

National Disaster Management Authority (NDMA) had earmarked the Armed Forces in 2008 as an important responder to any bio-threat in the country and had stated that by 2011 the Armed Forces will have a network of BSL 2 labs and a referral BSL 3 lab for detection of new bio-threat agents.[10] We were also to have adequate personnel immunized with anthrax vaccine and develop a command wise stockpile of drugs for responding to a bio-threat. There are gaps to be plugged, as creation and maintenance of stockpiles of vaccines are major policy decisions at Ministry of Defence (MoD) level, in view of limited shelf life and financial constraints.

The integrated approach of the CBRN is scientifically flawed, as the strategy for bio-threat preparedness in totally at variance from that used for Chemical, Nuclear and Radiation preparedness. The component of 'B' has not been able to grow in the shadow of the 'N', 'R and 'C'. It can no longer remain CbRN. With new genetic mutant strains emerging and widespread antimicrobial resistance being reported,[12] bio-threat preparedness is serious business, which needs a highly technical approach, coupled with ongoing research to match the wits of the virus/bacteria/toxin, to which a terrorist can have easy access. The cost per casualty with a nuclear and chemical weapon is estimated as $2000 and $600 respectively, while for bio-agents the cost is about $1 per casualty.[13]

Case for a specialized focus

Considering the above reasons, it is deemed essential that a separate specialized cadre needs to be formed, for dealing with the bio-threat. It is high time that the field of 'B' is given a dedicated focus and mechanisms put in place, right from the time of early detection through regular surveillance till the final mitigation of the threat.

The requirement is even more evident as in the civil setup this task is handled by the NDMA, which in itself is overburdened with the ongoing natural disasters in the country. It had come up with a guidelines for the management of biological disaster, 2008[14] but at present, most of the systems proposed need to be effective on ground. Whatever infrastructure exists, is not directly under its command and in case of actual scenario, valuable time would be wasted in inter-