Plague

The plague outbreak is over. It came, caught the health authorities unaware and went leaving us with the grim reality that, in spite of the great advances in science, we cannot afford to forget epidemic diseases. The recent outbreak of plague has shaken the country and the international community as no other disease has done in the recent past.

There has been no plague in India since 1966, but its re-emergence after 28 years conforms to the cyclic nature of this disease—a pattern which has been seen in many other countries. During the periods of quiescence, interest in and awareness of the disease waned and so did the technical expertise and resource allocation for the maintenance and updating of infrastructure. Many other more pressing priorities were allocated scarce resources.

Public health functionaries had, before the recent epidemic, forgotten what little they knew of plague's epidemiology; clinicians had virtually deleted it from the differential diagnosis of bacterial pneumonia or lymphadenopathy with fever and laboratories had lost expertise. Only the frugal infrastructure for plague surveillance at the National Institute of Communicable Diseases (NICD) was left to provide skeletal support.

However, even in this situation, the mortality in the recent outbreak was restricted to 54 cases though several rather controversial statements have been made regarding the aetiology and effects of the outbreak.

Plague is caused by *Yersinia pestis* (*Y. pestis*), a bacterium carried by rodents and transmitted by fleas in parts of Asia, Africa and the Americas. The first human epidemic on record was an outbreak among the Philistines in 1320 BC. There have been three pandemics of plague and India was affected in all of them. It suffered most in the third which started in Southern China in 1866. Between 1898 to 1948 an estimated 12.5 million deaths occurred in this country. Since then, plague in India has been essentially limited to its rodent hosts.

During the period 1978–1992 as many as 14,856 cases of plague with 145 deaths were notified by 21 countries to the World Health Organization (WHO) and even as late as 1992 nine countries notified a total of 1582 cases of human plague including 138 deaths. Six of these countries, viz. Brazil, Madagascar, Myanmar, Tanzania, Vietnam and the United States of America reported cases of plague nearly every year. These facts seem to have escaped the attention of the international community and the mass media in contrast to the minor outbreak of plague in India during 1994.

Yet India was put in international quarantine. Some countries stopped all flights to and from India and others insisted on evidence of vaccination against plague. A few stopped anyone from India entering their countries.
According to the WHO, a case is labelled as 'suspected plague' if one of the following conditions is met:

1. Clinical symptoms are similar.
2. If a Gram-negative bipolar coccobacillus is identified.

A case is labelled as 'presumptive plague' if one or both of the following conditions are met:

1. If the organism is immunofluorescence stain positive for the presence of the \( Y. \) \textit{pestis} F1 antigen, or if it is both immunofluorescence and Wayson/Wright-Giemsa stain positive.
2. If a single serum sample is detected to have antibodies against the F1 fraction of \( Y. \) \textit{pestis}.

A case is 'confirmed' to be plague if one or both of the following conditions are fulfilled:

1. In addition to Wayson/Wright-Giemsa and immunofluorescence positivity the organism is grown in culture and is positive by both bacteriophage and biochemical reactions.
2. Two serum samples, taken at appropriate times, demonstrate a fourfold difference in end point titres of plague specific antibodies.

Human plague was first diagnosed in the Beed District of Maharashtra on 6 September 1994 on the basis of clinical, epidemiological and laboratory evidence. Facilities for immunofluorescence staining for plague were not available in India at the time of onset of the outbreak. So the NICD was able to provide presumptive diagnoses on the basis of serological investigations.

While action to contain the disease in Beed was in progress, pneumonic plague emerged in Surat, Gujarat on 10 September 1994, the population panicked and an estimated 0.3–0.5 million left the city and fled to other parts of the country. The entire health machinery of India and the rest of the world started aggressive preventive and control measures.

In a serious disease such as pneumonic plague even with the presumptive diagnosis alone institution of control measures assumes primary importance. It would have been improper to wait for laboratory confirmation. Thus we mobilized material resources and personnel for human case surveillance, active case detection, case containment and treatment and contact tracing as well as prophylaxis. This paid rich dividends and large scale mortality and morbidity was avoided.

The increased flea density, rat fall, positive serology in rodents and the nature of the human cases left little doubt about the occurrence of plague in Beed. This was confirmed by the WHO international team who also carried out serological studies. In Surat as well as in Delhi, a fourfold rise of antibodies in paired serum samples of antibodies specific to the F1 antigen of \( Y. \) \textit{pestis} was observed in many samples. The WHO international team visited Delhi, Surat and Beed and endorsed the evidence of recent plague infection in man and animals in Beed and Surat. They and the WHO Director General also complimented the Government of India for mobilizing resources to effectively counter the outbreak.

During an outbreak of pneumonic plague if half a million potential carriers of the disease run away to different parts of the country, priorities have to be set and precious resources as well as manpower have to be reorganized effectively and deployed to prevent further spread. After the primary objective of control was achieved efforts were made to purify and characterize the culture isolates.

Apart from purely scientific issues, two more facets of the plague outbreak have been fiercely debated. One of them is the role of the press in exaggerating the facts and thus resulting in huge economic losses. The nation’s vernacular and English newspapers as well as the international press and mass media...
exaggerated the extent of the outbreak. Though it may be justified to demand that the press takes a rational and prudent view of such happenings, it must also be kept in mind that whatever appears in the media is a reflection of the thinking of the people. Panic was generated so effectively, because the very word 'plague' seems to be associated with hundreds of deaths and because both the public and medical profession were unaware of the changing epidemiology of the disease. Safe and potent antimicrobial agents are now available which have made plague easily treated.

Although a great deal of noise has been made about the tremendous economic loss suffered because of the outbreak of plague, very few have appreciated the role of health authorities in quickly and effectively containing the disease, without which the loss might have been much greater. What is more important is that the recent outbreak has exposed the major failings of our public health system. We need better sanitation, a more effective disease surveillance system and the institution of early warning mechanisms.

REFERENCES


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