

Editorial

Zoonotic Diseases in India : Focus on Research Options for Anthrax Control



AR Chogle*

Infectious Disease is one of the few genuine adventures left in the world.

- Hans Zinsser (1878 - 1940)

Zoonoses have been defined as diseases and infections that are naturally transmitted between vertebrate animals and humans. Globally, zoonoses are said to account for 60% of all infectious disease pathogens and 75% of all emerging pathogens. India having the second largest human populations, and one of the world's greatest densities of tropical live stock, possesses a favourable environment for the transmission of both known and novel diseases between animals and people. However, there is a fragmented nature of zoonoses research and control programs in India. At the government level, the Ministry of Health and Family Welfare targets zoonotic infections in humans, the Ministry of Agriculture focuses on zoonoses in domestic animals and commodities, and the Wildlife Institute of India addresses in wildlife, attempts to collaborate across these institutions and other educational, research and policy organization suffer many challenges. The Roadmap to Combat Zoonoses in India (RCZI) initiative was launched in June 2008 with the vision of supporting and promoting integrated zoonotic disease prevention and control.¹

Priority research themes for zoonoses in India laid down by RCZI are :

1. Measure the morbidity, mortality, and economic burden of disease in humans and animals.
2. Determine the spatial, temporal, and directional interactions of transmission between wildlife, humans, and domestic animals.
3. Develop field diagnostics for zoonotic diseases.
4. Conduct cost-benefit, cost-effectiveness, and affordability analyses of zoonoses interventions.¹

Anthrax is one of the eleven major zoonotic diseases accorded a priority status in India by the expert group of RZCI.¹ However, the actual incidence of anthrax in India is not known accurately mostly due to underreporting.² Many regions in India are still enzootic for animal anthrax but it is less frequent or absent in North India, and sporadic cases of human anthrax have been reported, especially from South India.

The current issue of the journal contains a report of Cutaneous Anthrax Outbreak from a tribal village in West Bengal.⁴ Though this report does not add any new facts regarding Anthrax, it has a good pictorial description of Cutaneous Anthrax. The hallmarks of Anthrax are haemorrhage and oedema. In cutaneous cases of Anthrax, these findings are limited to the tissue immediately adjacent to the site of inoculation. The early clinical diagnosis of cutaneous anthrax is easy provided there is a high index of suspicion on the part of the physician. The suggestive cutaneous findings are oedema out of proportion to the size of the lesion, lack of pain during the early phases of infection and the rare presence of polymorphonuclear leucocytes in the gram's stain

of the smear made from vesicular fluid. In the background of suggestive history and a robust epidemiological proof, the diagnosis can usually be established by conventional methods like Gram's stain from the fluid and culture on blood agar plates.

The current report⁴ does not mention the differential diagnosis of cutaneous anthrax. One of the diagnosis which is to be considered is Milkers Nodules, contracted from the teats of the cow and characterized by one or several brownish red dome shaped smooth or slightly, papillomatous vegetation (resemble pyogenic granulomas) which are generally confined to the hands and forearms.⁵

Penicillin has long been considered the drug of choice for the treatment of (cutaneous) anthrax, and only rarely has penicillin resistance been found in naturally occurring *B. anthracis* strains. In vitro testing shows *B. Anthracis* to be susceptible to penicillins, fluoroquinolones, tetracycline, chloramphenicol, aminoglycosides, macrolides, imipenem, rifampicin and vancomycin. The organism is usually resistant to cephalosporins, trimethoprim and sulphonamides.⁶

The current report in the journal⁴ is very similar to a report of anthrax outbreak from Murshidabad District of West Bengal occurring in the year 2007.⁷ Both these reports bring into focus the research options for anthrax control in India. The populations of concern were groups with frequent exposure to domestic and wild animals such as farmers and tribal communities. In this vulnerable populations behavior change interventions particularly regarding unhygienic food practices need targeting. Also, as this vulnerable population is present in remote areas without access to laboratories or trained personnel, tests for diagnosis confirmation should be simple and portable. Research for anthrax control in India should be driven by a research theme, mainly, cost benefit, cost effectiveness and affordability of interventions. This information should provide policy makers the means to select and monitor zoonotic disease interventions in Indian situations.¹

References

1. Sekar N, Shah NK, Abbas SS, Kakkar M. Roadmap to combat zoonoses in India (RCZI). Initiative et al (2011). Research Options for controlling Zoonotic Disease in India. 2010-2015. PLOS ONE 6:e17120. Doi:10.1371/journal.pone.0017120.
2. Lalitha MK. Human Anthrax : Experience over two decades. Round Table Conference Series Number 9. New Delhi, India : Ranbaxy Science Foundation; 2001;51-7.
3. Dutta KK. Emergence of anthrax as an agent of Bioterrorism. Round Table Conference Series Number 9, New Delhi, India : Ranbaxy Science Foundation 2001;1:1-20.
4. Chakraborty PP, Thakurta SC, Satpathi PS, Hansda S, Sudipta S, Arun Achar, Banerjee D. Outbreak of Cutaneous Anthrax in a tribal village - A Clinico-Epidemiological Study. *J Assoc Physicians India* 2012;60:89-93.
5. Thappa DM, Karthikeyan K. Anthrax : An overview with the Indian subcontinent. *Int J Dermatol* 2001;40:216-222.
6. Spencer RC, Bacillus anthracis. *J Clin Pathol* 2003;56:182-187.
7. Ray TK, Hutin YJ, Murhekar MV. Cutaneous Anthrax, West Bengal, India, 2007 *Emerg Infect Dis* 2009;15:497-499.

*Rtd. Chief Physician, Kasturba Hospital for Infectious Diseases, Mumbai 400 008; Consultant Physician, Sir H.N.Hospital & Research Centre, Mumbai 400 004; Saifee Hospital, Mumbai 400 004.