TAJ June 2017; Volume 30 Number-1

ISSN 1019-8555
The Journal of
Teachers Association
RMC, Rajshahi

Original Article

Cutaneous Anthrax Outbreak in Rajshahi District

Md. Azizul Haque[1], Mohammad Mahbubur Rahman Khan[2], Laila Shamima Sharmin[3], Khandaker Md. Faisal Alam[4], Md. Khalilur Rahman[5], Md. Shah Alam[6]

Abstract

Anthrax is an acute, zoonotic infectious disease caused by gram positive, aerobic, spore forming bacterium *Bacillus anthracis.* Cutaneous anthrax is the commonest form of anthrax, comprising more than 95% of cases. Incidence of anthrax is declining in the developed countries; but because of inadequate livestock vaccination program, it remains a public health hazard in the developing countries. Several cutaneous anthrax outbreaks were observed in Bangladesh over the last few years and the latest one occurred in Lalitnagar village, Godagari Upazilla of Rajshahi district in September 2016. We are reporting clinico-demographic profile and treatment outcome of the affected patients with the aim of increasing awareness among the clinicians and public health experts.

Keywords
Cutaneous anthrax outbreak, Clinical and Demographic profile, Treatment response, Bangladesh

TAJ 2017; 30: No-1: 17-20

Introduction

Anthrax is an acute, zoonotic infectious disease caused by gram positive, non-motile, aerobic, spore forming bacterium *Bacillus anthracis.* Antharx is usually a disease of herbivore animals and humans are incidentally infected. Humans can acquire anthrax from contact with infected animals, animal products or spores in the soil. Anthrax probably originated 6,000 to 7,000 years ago in Mesopotamia and Egypt, where agricultural civilization was first recorded. Fifth plague mentioned in Bible (Exodus 9:3), that killed all the cattle of Egypt overnight, probably was an anthrax outbreak.

Anthrax exists in three forms- cutaneous, inhalational and gastrointestinal. Cutaneous anthrax is the commonest form of anthrax, comprising more than 95% of cases. Gastrointestinal anthrax is usually caused by consumption of insufficiently cooked meat of anthrax-infected animal. Inhalational anthrax is rare in naturally infections and is usually associated with processing wool and hides in enclosed factory space, where aerosolized spores *of bacillus anthracis* are inhaled.[1]Cutaneous anthrax results from skin exposure to spores of *B. anthracis*. It was previously thought that cutaneous breech is needed as an entry point for spores, but this has not been a documented feature of the cutaneous cases from 2001. The inoculum size responsible for causing cutaneous anthrax cases remains to be determined.[2] The incubation period generally ranges from 1–12 days.[3]The

1 Associate Professor, Department of Medicine, Rajshahi Medical College, Rajshahi.
2 Associate Professor, Department of Medicine, Rajshahi Medical College, Rajshahi.
3 Junior Consultant, Paediatrics, Rajshahi Medical College Hospital, Rajshahi.
4 Associate Professor, Department of Microbiology, Rajshahi Medical College, Rajshahi.
5 Associate Professor, Department of Medicine, Rajshahi Medical College, Rajshahi.
6 Professor, (Current Charge), Department of Microbiology, Rajshahi Medical College, Rajshahi.

initial symptom is pruritus at the infection site, which is followed by a painless papule that progresses to a vesicle in 1–2 days, then forming a highly characteristic necrotic ulcer with a black center, called eschar. There may be extensive edema surrounding the lesion that presumably reflects the activity of "edema toxin. Cutaneous anthrax can be self-limiting, and lesions resolve without complications or scarring in 80–90% of cases with treatment. But if left untreated, extensive oedema and toxaemic shock may lead to death in some cases.[4] The diagnosis is confirmed by bacteriological examination of the lesion or isolation of *B. anthracis* from the infected ulcer or blood by culture. Incidence of anthrax is declining in the developed countries; but because of inadequate livestock vaccination program, it remains a public health hazard in the developing countries, especially Middle East, Central and South East Asia, and African countries.[5]

We are reporting clinico-demographic profile and treatment outcome of the affected patients with the aim of increasing awareness among the clinicians and public health experts.

Materials and Methods

This is a descriptive cross-sectional study of cutaneous anthrax cases during a recent outbreak in Lalitnagar village, Godagari Upazilla of Rajshahi district in September 2016.An imported buffalo from India purchased for sacrifice in Eid ul Azha became gravely sick on 10th September, 2016. To minimize the loss, owner of the buffalo decided to slaughter it and sell the meat. Characteristic cutaneous lesions of anthrax appeared few days later in thirteen people involved in butchering, handling of skin and meat. Two patients attended Rajshahi Medical College Hospital for consultation; the remaining cases were detected during visit to the affected locality. Cutaneous anthrax was diagnosed by history of exposure to sick buffalo, the typical appearance of black eschar with or without peri-lesional oedema and microbiological evidence of presence of large gram positive bacilli. Culture was not attempted because of biosafety concerns.

Findings:

Table 1: showing demographic characteristics of the affected cases

	number (n)	Percentage
Age		
mean age in years (range)	*36.3 (11-60)*	
Sex		
Male	*10*	*77*
Female	*3*	*23*
Socioeconomic class		
Lower middle class	*13*	*100*
Education		
Illiterate	*7*	*54*
Primary education	*6*	*46*

Figure 1: Laboratory-confirmed cutaneous anthrax case

Table 2: Summary of findings of our study

Types of exposure	Number	Percentage
Handling raw meat	7	54%
Butchering	5	38%
Carrying skin of buffalo	1	8%
Sites of lesion		
Hands	9	69%
Forearm	2	15%
Foot	1	8%
forehead	1	8%

Median time from exposure to illness was 6 days (range 5-7 days). None of these patients had any systemic, gastrointestinal or respiratory symptoms. In all 13 cases, gram positive bacilli were found in gram stain and none of these patients received any antibiotic prior to diagnosis. Oral ciprofloxacin for two months was prescribed for treatment. The patients were re-examined one month later during follow up visit to the locality. In all cases, cutaneous lesions were in the healing stage. After completion of two-month antibiotic therapy, all the patients were cured.

Discussion

Animal anthrax, locally known as "Torka" in Bangladesh, has been documented in Bangladesh for many decades. Several environmental factors including high ambient temperature and relative humidity contribute to presence of anthrax in Bangladesh.[6]

No human anthrax cases had been reported in Bangladesh for 25 years before 2009. It does not necessarily mean nonexistence of anthrax in the community, under-diagnosis and poor reporting of the sporadic cases might be the reason. Muhammad Afsar Siddiqui reported 15 cases of cutaneous anthrax in Bangladesh in 2012. In his paper he showed that, the mean age of his cases was 21.4 years (ranging from 3 to 46 years), 7 (46.7%) being males and 8 (53.3%) females. The majority of cases were from lower middle socioeconomic status. Types of exposures included butchering (20%), contact with raw meat (46.7%), and live animals (33.3%). Malignant pustule was present in upper extremity only, both upper and lower extremities, face, and trunk at frequencies of 11 (73.3%), 2 (13.3%), 1 (6.7%) and 1 (6.7%) respectively. Anthrax was confirmed in 13 (86.7%) cases by demonstration of gram-positive rods. All cases were cured with 2 months oral ciprofloxacin combined with flucoxacillin for 2 weeks.[7]His findings are mostly similar to our findings. Unlike his study, we used only ciprofloxacin for two months as treatment.

Because of lack of veterinary services and lack of awareness about anthrax vaccination, cattle owners of Lalitnagar, Godagari did not vaccinate their cattle against anthrax. Cattle owners of Lalitnagar area were also not aware about proper disposal technique of dead cattle; they usually throw the dead cattle in the river or leave the carcass in the open field. This factor might have contributed to spread of *bacillus anthracis* spores in the grazing area. Because of poor veterinary service and because of lack of coordination between government agencies and NGO's working in Lalitnagar area, unusual death of cattle is rarely reported.

Conclusion:

Incidence of anthrax is declining in developed countries, but lack of awareness in the community regarding zoonotic transmission of anthrax & the need for livestock vaccination, inadequate anthrax vaccine supply, inadequate veterinary services for sick animals and poverty all contribute to recurrent outbreaks of cutaneous anthrax in Bangladesh. Early diagnosis, proper management and mandatory reporting to appropriate health authorities are essential to improve the outcome.

References

1. Swartz MN. Recognition and management of anthrax: an update. N EnglJ Med. 2001; 345:1621–1626.
2. Henderson D A, Inglesby T V, Bartlett J G, Borio L. Management of Anthrax. Clin Infect Dis, 2002; 35 (7): 851-858
3. Centers for Disease Control and Prevention. Human anthrax associated with an epizootic among livestock—North Dakota, 2000, MMWR Morb Mortal Wkly Rep , 2001, vol. 50 (pg. 677-80)
4. Doganay, M. Anthrax. in: J. Cohen, S.M. Opal, W.G. Powderly (Eds.) Infectiousdiseases. 3rd ed. Mosby-Elsevier, China; 2010: 1257–1261
5. Turnbull, P.C.B. in: WHO Anthrax Working Group. Anthrax in humans and animals. 4th ed. World Health Organization, Geneva; 2008
6. World Health Organization. Anthrax in Animals and Humans. 2008. http://www.who.int/csr/resources/publications/anthrax webs.pdf
7. Siddiqui M A, Khan MAH, Ahmed SkS et al. Recent outbreak of cutaneous anthrax in Bangladesh: Clinico-demographic profile and treatment outcome of cases attended at Rajshahi Medical College Hospital. BMC Research Notes 2012; 5:464

All correspondence to
Dr. Md. Azizul Haque
Associate Professor, Medicine
Rajshahi Medical College
Email: drazadbd@gmail.com