Eyelids Involvement of Cutaneous Anthrax

Cilt Şarbonunda Göz Kapağı Tutulumu

Hasan KARSEN, MD,[a]
Fazilet DUYGU, MD,[b]
Hadi GEYLAN, MD,[c]
Masuk DEMİRTAŞ, MD,[d]
Mahmut SÜNNETÇİOĞLU, MD,[e]
Ahmet SATICI, MD,[f]

Departments of
[a]Infectious Diseases and Clinical Microbiology,
[f]Ophthalmology,
Harran University Faculty of Medicine, Şanlıurfa
[b]Clinic of Infectious Diseases,
Tokat State Hospital, Tokat
[c]Clinic of Pediatrics,
Private Divan Hayat Hospital,
[e]Department of Infectious Diseases and Clinical Microbiology,
Van Education and Research Hospital, Van
[d]Clinic of Pediatri,
Private Batman Hospital, Batman

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Yazışma Adresi/*Correspondence:*
Hasan KARSEN, MD,
Harran University Faculty of Medicine, Infectious Diseases and Clinical Microbiology, Şanlıurfa, TÜRKİYE/TURKEY
hasankarsen@hotmail.com

ABSTRACT Objective: Although palpebral anthrax is considered as a form of cutaneous anthrax, its incidence is rare. However it is associated with high complication sequelae and mortality rates. Our purpose is to present 10 patients with eyelids anthrax. **Material and Methods:** This study was designed as a retrospective study. The patients files were collected and investigated for their history, clinical and laboratory findings, as well as treatment regimes and outcomes. **Results:** All patients had malignant oedema (it is characterised excessive oedema, bullies, induration, toxaemia at intense local reaction). Six patients had had previous antibiotic use before they were administered to our clinic. Therefore culture positivity was observed only in 5 (%50) patients. It was found that their antibiograms of isolates were susceptible to penicillin, ciprofloxacin and cephasoline. Other five patients were diagnosed only by clinical findings. All patients were treated with cephasoline because of its cost effectiveness and easy use. Two patients died; one patient recovered without any sequel. The rest seven patients developed deformities and scars on their eyelids. **Conclusion:** Eyelids anthrax is serious disease since its mortality and sequela are high. Early diagnosis and treatment are necessary to save the lives. We think that cephasoline can be used as primary choice in treatment due to cost effectiveness and ease of use.

Key Words: Anthrax; eyelids

ÖZET Amaç: Cilt şarbonunda göz kapağı tutulumu nadiren görülmesine rağmen mortalitesi ve sekel kalma oranı yüksektir. Bu yazıda göz kapağı tutulumuyla seyreden 10 olguyu sunmayı amaçladık. **Gereç ve Yöntemler:** Bu çalışma hasta dosyalarının retrospektif incelenmesiyle yapıldı. Hastaların hikâyeleri, klinik ve laboratuvar bulguları ile tedavi ve tedavi sonuçları kaydedildi. **Bulgular:** Bütün hastalarda malign ödem (aşırı ödem, bül, endurasyon ve toksemi ile karakterize lokal reaksiyon) mevcuttu. Hastalardan 6'sı kliniğimize başvurmadan önce antibiyotik kullanmışlardı. Bu yüzden sürüntü kültüründe ancak 5 (%50) kişide üreme oldu. Diğer hastalara klinik bulgularla tanı konuldu. Kültür antibiyogramların tümü penisilin, sefazolin ve siprofloksasine duyarlı idi. Kullanım kolaylığı ve ucuz olması nedeniyle tedavide sefazolin tercih edildi. Tedavi sonunda iki hasta öldü, bir hasta sekelsiz iyileşti. Yedi hastanın göz kapaklarında ise çeşitli deformiteler ve skar dokusu kaldı. **Sonuç:** Göz kapağı şarbonu, mortalite ve sekel kalma oranı yüksek olduğundan ciddi bir hastalıktır. Erken tanı ve tedavi hayat kurtarıcıdır. Kullanma kolaylığı ve ucuz olması nedeniyle sefazolin ilk tercih olarak kullanılabilir.

Anahtar Kelimeler: Şarbon; göz kapakları

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Anthrax is mainly an illness of herbivorous animals. It is transmitted to humans from sick animals. It is formed in three clinical forms; cutaneous anthrax, respiratory anthrax and gastrointestinal anthrax.[1,2] It lost its importance due to decrease in incidence among humans world wide, but it re-gets its place in the agenda for its potential use in bioterro-

rism attacks. Although palpebral anthrax is a form of cutaneous anthrax, its occurrence is very rare. In this article 10 patients with eyelid involvement were reviewed and discussed.

MATERIAL AND METHODS

This retrospective study was designed as a descriptive one. The information on patients age, gender, occupation, clinical symptoms and findings, location and type of lesions, history, laboratory findings, treatment and outcome were recorded. Data were collected whether our patients had history of contact with animals and these animals were diseased or not.

Cultures were taken from all lesions. Blood cultures were also performed from those having fever on conventional media. Blood agar medium was used for lesion culture. Non haemolytic grey-white large flat colonies irregular edges were seen on blood agar. Gram stain of these colonies showed Gram positive long rods arranged in chains. Pink capsules around blue bacillus were observed in polychrome methylene blue stain (McFadden reaction). The patients were diagnosed according bacteriological findings and/or clinical sign.

RESULTS

Total 10 patients (6 females and 4 males) were admitted to our clinic. The age range was 8-40 years. All patients were engaged in animal husbandry All patients had history of contact with animals. These animals were dull and malaise and had bloody stool, hamorrhagic mastitis. At postmortem, ecchymosis in intestines were also observed. Palpebral involvement was observed in right eyes of 6, and left eyes of 4 patients. All patients had malignant oedema which is a charactheristic excessive oedema, bullies, induration, toxaemia at intense local reaction. In addition, two patients showed malignant pustule, pathognomonic for anthrax, which is typically a black necrotic eschar tissue. Six patients had history of antibiotic use before admission to our clinic. So, culture positivity was observed only in 5 (%50) patients. Other five patients were diagnosed according to clinical findings. Mean values for C-reactive protein and white blood cell were 81 mg/dl (normal 0-10 mg/dL), 16600/mm^3 respectively. It was found that all isolated organisms were susceptible to penicillin, ciprofloxacin and cephasoline. All patients were given cephasoline. In order to decrease oedema, steroid (dexamethasone 4x8 mg/day/IV) was used for 3-5 days. Pomade with antibiotics was used to prevent scar and secondary infection. Unfortunately, One patients died after 12 hours of hospitalization. In another patient, dyspnea developed after 2 hours of hospitalization and died during tracheostomy operation. Seven patients had deformity and scar in their eyelids and they were referred to the plastic surgery and ophthalmology clinic. Only one patient recovered without any sequel.

DISCUSSION

Anthrax is one of important infectious diseases. Its significance has lessed over time due to decrease in its incidence. It is estimated that 20.000-100.000 new cases were seen annually. Thorough 1971 to 1980, 10973 (52%) cases were reported in Turkey.[3] The disease is still endemic in Turkey and other Middleeast contries and in several Latin American countries and some African countries such as Zimbabwe.[4] It regained its importance after 11th September 2001 bioterrorism attack.* From point of its danger, anthrax bacilli are regarded as bioterrorism agents. Anthrax spores are very resistant to external unfavourable conditions but they can be inactivated with boiling for 30 minutes at 140°C. They can cause rapid death following respiratory systems infection. Therefore this bacterium is often preferred as an agent of biological warfare.[5] Cutaneous anthrax may result from inoculating spores into abraded skin or mucosa and characteristic oedematous lesions developed rapidly.[6] Characteristic lesions may occur in hands, arms, fingers, face, neck and eyes by contact with the infected material.

Although eyelids anthrax is seen rarely, it has a serious consequence. It causes intense oedema in lesions localised in periorbital region and tends to disseminate to face, neck and thoracic wall. Malig-

* Carus WS. Bioterrorism and biocrimes:the illicit use of biological agents in the 20th century. http://www.ndu.edu/centercounter/prolif_publications.htm; 2001.

nant edema is called to cutaneous anthrax, caused excessive oedema, bullies, induration, deep toxaemia characterised by intense local reaction. Anthrax localised in periorbital region, usually progressed as malignant edema.[5,6] It may also cause dyspnea by making pressure on trachea.[7,8] Anthrax organism has lethal factor, (LF), edema factor (EF), and protective antigen (PA) inserted to the cell via endocytosis by constituting a complex which activates adenyl cyclase. This enzyme increases cyclic AMP level and distrupts water metabolism inside of the cell causing oedema. LF stimulates macrophages and causes release of TNF-α and IL-1β. These cytokines are partially responsible for unexpected mortality. The other reason of mortality is respiratuvar distress developed as a result of pressure on trachea caused by excess oedema in the neck.[9,10] High fever, toxaemia, hypotension and shock may be seen in these patients. Our patients had clinical signs for malignant oedema. Two patients had malignant pustule in addition to malignant oedema. Two of our patients died due to respiratory obstruction. Lesions localised in the eyelids may leave scar and deformity inspite of treatment. These sequelae can be reconstructed via surgery. In our study, seven patients had deformity and scar in the eyelids. We recommended them to be treated in plastic surgery and ophthalmology clinic. The male patient who admited to hospital 7 days after appearance of lesion died 12 hours later (Figure 1). The female patient who admited hospital 8 days after appearance of lesion underwent surgery for tracheostomy due to dyspnea also died due to respiratuvar distress after 2 hours. The mortality rate is reported as <1% in cutaneous anthrax. Although eyelid anthrax is also a type of cutaneous anthrax. We think that this should be evaluated more seriously as a different clinic entity due to association with high rate of mortality (20%), and sequel formation (70%). One of our patient who admitted to us 2 days after the onset of lesion, recovered without leaving any sequel (Figure 2a, b). Seven patients who had deformity and scar in the eyelids were admitted 4-5 days to our clinic after the onset of the lesion. This clearly indicates that early application and management of anthrax patients the better chance of recovery and decreased probability of death and sequel. Antibiotics have not antitoxic activity and can not prevent the release of toxin, so serious complications

FIGURE 1: The male patient with malign edema, who died despite medical therapy.

FIGURE 2a: Pretreatment picture of a patient with malign edema.

FIGURE 2b: Posttreatment picture of full recovery without any sequel.

can be seen in delay admission and late treatment.[9,11,12]

The eye is an important site for infectious disease because an incorrect diagnosis and delay in therapy can cause loss of vision or death. The differential diagnosis of ophtalmic anthrax includes erysipelas, preseptal and orbital cellulitis. Clinicians must be careful in the differential diagnosis since the treatment policies are different.[13] Although culture is the gold standart for diagnosis, specimens may not always yield bacterial growth in culture. In numerous studies, diagnosis was suggested according to clinical sings.[4,12] Only 5 patients in the study group had bacterial growth in culture (50%), since the other patients using antibiotic before admission to hospital. Engin A et al reported that culturing of 39 wound specimens yielded 43.6% *Bacillus anthracis* strains.[14] It is required to start treatment as soon as anthrax suspected without waiting culture results. We presented patients's pictures to help clinicians in anthrax diagnosis. In many previous studies penicillin-G was preferred for the treatment.[15-17] We used cephasoline in treatment since it is cost effective and ease of use. Cephasoline dose in adults is 3 x 1 g/day intravenous (IV) and in children is 3 x 15 mg/kg/day IV. Treatment duration in cases with secondary infection was 14 days and in those without it was 10 days. We compared features of three antibiotics (Cephasoline for adult's dose 3 x 1 g/day IV, Penicillin-G for adult's dose 8 x 3 million IU/day IV and Ciprofloxacin 2 x 400 mg/day IV) in Table 1.

CONCLUSION

Eyelids anthrax should be considered seriously in any patient with a oedema or black eschar in periorbital region. Early diagnosis and treatment are necessary to save lives since the mortality and sequel rates are high. We think that cephasoline can be used as primary choice due to cost effectiveness and ease of use.

TABLE 1: Comparison of antibiotic cost and effectivity in treatment of eyelid anthrax.

Features	Ciprofloxacin	Penicilin-G	Cephasoline
Culture antibiogram	susceptible	susceptible	susceptible
Cost for 10 days (for adults)	746 dolars	426 dolars	106 dolars
Way of use	IV	IV	IM/IV

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