

Possibilities of retrospective confirmation of being ill with cutaneous anthrax after being cured with the use of antibiotics – case study

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Summary

An infection with a form of cutaneous anthrax which is rarely observed nowadays and the history of laboratory research confirming the clinical diagnosis have been described. A possibility enabling to confirm the diagnosis at the stage when bacteria are eliminated by the antibiotic therapy and, consequently, a possibility to receive negative results in a culture test have been determined. Having cured the disease with antibiotics and eradication of bacteria, a test for bacillus anthracis protective antigen was used. This is an irreplaceable method to diagnose this infection in an retrospective manner which is significant in terms of determining epidemiological investigations.

Key words: words: cutaneous anthrax, diagnosis, antibiotic therapy.

Introduction

Anthrax is an acute disease infecting people and animals. It is caused by bacterium *Bacillus anthracis*. In regard to people, there are three forms of anthrax: cutaneous, pulmonary and gastrointestinal. The form which is observed relatively most often is cutaneous one which is described under traditional names: carbuncle, anthrax, malignant carbuncle [1]. People become infected as a result of contact with animals suffering from anthrax

or infected products of animals origin. Breeders, butchers, veterinary staff, morticians, employees working in industry connected with wool and bristle processing belong to the group of people who are exposed to anthrax infection [2,3].

The incubation period of cutaneous anthrax lasts about 4-5 days from the moment of infection. Initially, a papule appears at the place of infection. It transforms quickly into a blister and then into

an ulcer filled with bloody, dark fluid (black dot) which becomes a black eschar surrounded by non-painful swelling with blisters filled with colorless effusion fluid [4].

In the later stage of the disease, purulent changes may appear as a result of local infection with other pathogenic bacteria. Penicillin is often chosen as the medicine. In regard to people, being ill with anthrax results in a specific immunity which lasts approximately one year. Cutaneous anthrax in its mild form often ends with self-healing, even without any scars left at the place of infection [5].

Case study

An eight-year-old girl got a pauple in the left corner of her mouth, at the border between the redness of her mouth and the skin. Subsequently, her left cheek swelled and the pauple transformed into a black blister. Initially, the patient was treated with biseptol. One week later, the temperature of the patient rose to 38°C and she was sent to a hospital where treatment with metronidazole and zinacef began. Due to the fact that the condition of the patient stayed unchanged, she was transferred to the Ward for observation and infectious diseases of children at the Specialist Hospital for Children in Cracow (*Oddział Obserwacyjno Zakaźny Dziecięcego Szpitala Specjalistycznego w Krakowie*) with suspected cutaneous anthrax. Gradually, a considerably big, very hard, non-painful swelling appeared around the black blister. It comprised entire cheek from the bottom border of the eye socket and pinna to considerably big part of mandible and neck. The archived image of the anthrax skin lesion observed before the treatment is presented in the Figure 1.

In the health center, crystal penicillin was included in the treatment (4x2000 000 UI) which led to subsidence of temperature. A few days later, the swelling around the blister became soft. After 6 days, the scab demarcated and the swelling gradually decreased. When the scab had demarcated, the skin lesion became filled with granulation tissues.

On the basis of the clinical image and results of treatment, the diagnosis of cutaneous anthrax was confirmed. For the purpose of laboratory



Figure 1: The image of developed anthrax skin lesion on the face of the patient before she was treated with penicillin.



Figure 2: The face of the same patient after treatment

approval, a discharge from drying blister was taken and it was sent to be bacteriologically tested to the Military Institute of Hygiene and Epidemiology in Puławy, Poland. Results of both microscopy and culture test of the material delivered were negative. In such a situation, when the bacteriological test did not confirm the diagnosis, blood and serum sample was taken from the patient and it was sent for a test for a bacillus anthracis protective antigen (protective antigen – PA) to the specialist center in England dealing with the research on anthrax (Centre for Applied Microbiology and Research CAMR), where, with the use of ELISA method,

PA antibodies were found positive, with high titre 1:1600. The patient was discharged from hospital in a good condition. She was supposed to be treated at outpatients' clinic in accordance with instruction concerning the intake of ampicillin 4x1 capsule for 10 days, laktid 1x1 ampoule, alvityl 1x1 teaspoon and locally, on the disappearing skin lesion – 2% ichthyol 2% solution. Having finished the treatment with the use of ampicillin, the treatment was documented with Figure 2.

Review

In order to confirm the clinical diagnosis of anthrax, a bacteriological test conducted in the right time often emerges to be sufficient (microscopy of the material tested for bacillus anthracis and culture tests). In the studied case, a sample for a bacteriological test was taken too late, when the treatment had already been started and bacillus anthracis had been killed with penicillin. As the procedure described determines, in such a case there is one more alternative to confirm

a clinical diagnosis – a serological blood test for antibodies for bacillus anthracis protective antigen (PA). It can be used even if treatment with antibiotics had been provided. PA is a constant component of anthracis toxins; antibodies produced are maintained in blood of convalescent for a long time [6,7].

The studied case presents infection with a form of anthrax which is rarely observed nowadays. The description of the diagnosis of this case should attract interest of people who are devoted to counteraction against terrorism dangers [8]. Infections with cutaneous anthracis were noted in the USA in 2001, during anthrax attacks. Description of this case involves a situation when it was possible to confirm the diagnosis of already cured anthrax despite of negative results of microscopy and culture tests. What emerged to be irreplaceable in this case, was a serological test. Such situations can happen when an epidemiological investigation is conducted retrospectively on how pockets of infection come into being in the case of infection pockets triggered off terroristically [9,10,11].

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