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The Impact of Empiric Antibiotic Therapy on Ecthyma gangrenosum – Case Report

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W.Helen*

Assistant Professor, Faculty of Pharmacy, Bharath Institute of Higher Education and Research (BIHER), Chennai, Tamil Nadu, India

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ABSTRACT

Ecthyma gangrenosum is a cutaneous necrotic lesion that is mostly seen in immunocompromised patients. It reflects severe sepsis, possibly caused by *Pseudomonas aeruginosa.* Here presented a case of a 52-year-old male patient admitted to the surgery department who presented sepsis associated with green colour pus discharge with pain and swelling. Empiric antibiotic therapy was prescribed. After 7 days of admission, pus culture were positive for *Pseudomonas aeruginosa*. As a result, the decision was made to continue the antibiotic therapy. And the outcome of empiric therapy leads to granulation tissue formation. The positive results are seen in the treatment with simple antibiotic therapy in this Ecthyma gangrenosum patient.

INTRODUCTION:

Ecthyma gangrenosum (Eg) is a rare but typical skin manifestation, most commonly caused by Pseudomonas aeruginosa (Pa), an aerobic Gram-negative opportunistic pathogen that has a high risk of associated mortality in cases where the infection is systemic. [1,2] These skin lesions may be seen on admission or can develop later. The recognition of Ecthyma gangrenosum lesions permits the earliest possible introduction of the most effective antimicrobial therapy, which is a key prognostic factor for survival.

CASE REPORT:

A 52-year-old male patient was admitted to the surgery department with the complaint of an unhealing ulcer in the right leg associated with green colour pus discharge, fever, pain and swelling. He had no recent history of contact with contagious diseases or foreign travel, no familial medical problems, or alcoholic. He was on hypertension treatment (T.Amlodipine 2.5mg twice daily and T.Atenolol 50mg once daily) for past 2 years and had received the appropriate immunizations.

His vital signs on admission included a temperature of 100° F, heart rate of 84 beats per minute, respiratory rate of 22 breaths per minute and blood pressure of 140/80 mmHg. Systems examination was normal. Necrotic lesions were visible on the right leg. The largest of the 10-centimeter necrotic lesion with green colour pus discharge (Fig.1).

Two hours from admission the urine, blood and pus cultures were drawn, debridement of the wound was done and empiric intravenous Ciprofloxacin (200mg twice daily) and Metronidazole (500 mg twice daily) were initiated. Dressing of the wound was done regularly.

The white blood cell count was 10,000 cells per microliter, the hemoglobin level was 9 g/dL, and the differential count was P-76%, L-21% and E-3%. The erythrocyte sedimentation rate was 22 mm/hour. Fasting blood sugar was 112 mg/dL and postprandial blood sugar was 204 mg/dL. Total bilirubin level was 1.5 mg/dL, direct bilirubin level was 0.5 mg/dL, aspartate transaminase (SGOT) was 60.0 mg/dL, serum alkaline phosphatase was 226.0 mg/dL. Blood Urea nitrogen level was 54 mg/dL and serum creatinine was 2.0 mg/dL.

Blood sugar level, Liver function tests, blood urea nitrogen and serum creatinine levels were increased. Chest radiographs, KUB and Doppler study of both lower limb arteries and venous system were normal. After 2 weeks plus culture test report revealed *Pseudomonas aeruginosa* organism.

After 14 days due to the antibiotic treatment of intravenous ciprofloxacin and metronidazole, the infection was under control, granulation tissue is formed in the wound and since *Pseudomonas aeruginosa* is aerobic bacteria the development of an organism is prevented due to tight dressing of the wound. The oral antidiabetic drugs like Metformin 500mg and Sitagliptin 100mg was given once daily to control blood sugar level.

Since the infection was under control and the patient is an alcoholic the selection of other broad-spectrum antibiotics can cause hepatotoxicity. So, the same antibiotic treatment was continued and two months later the skin lesion had healed (Fig.2).

Figure.1

Figure.2

DISCUSSION:

Pseudomonas aeruginosa is an opportunistic bacterium, which can be found on the skin, in the nose and throat, and in the stools. It generally causes infection in immunocompromised patients with conditions such as neutropenia, immunodeficiency, and hypogammaglobulinemia.[3] The presence of *Pseudomonas aeruginosa* infection in healthy subjects is very uncommon.[4]

In some reported cases of *Pseudomonas aeruginosa* causes sepsis, fever, diarrhea, pneumonia, skin lesions (50%), and shock are the most relevant associated symptoms.[5,6]

Ecthyma gangrenosum is a well-recognized cutaneous manifestation of *Pseudomonas aeruginosa* infection with or without septicemia.[7,8] It is described as an uncommon vasculitis, affecting the adventitia and media of blood vessels and caused from either hematogenous seeding of a pathogen, or direct inoculation through the skin.[4]

The lesion begins as a painless red macule that enlarges and becomes a slightly elevated papule. It evolves to a hemorrhagic bulla that ruptures, forming a gangrenous ulcer with a gray-black eschar surrounded by an erythematous halo.[9]

In classic bacteremic Ecthyma gangrenosum, the lesion represents a blood-borne metastatic seeding of Pseudomonas aeruginosa to the skin. However, there are a few reports that Ecthyma gangrenosum can represent localized skin eruptions that are not accompanied by bacteremia or systemic infection.[10]

Early diagnosis and aggressive therapy are important in the management of Ecthyma gangrenosum. As the patients with Pseudomonas bacteremia have been reported to have a mortality rate of 38%.[11]

CONCLUSION:

This case points out that, Ecthyma gangrenosum can occur in previously healthy individuals with no other medical issues. Empiric antimicrobial therapy for Ecthyma gangrenosum which includes ciprofloxacin and metronidazole is effective against pseudomonas.

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