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Case Report

A NOSOCOMIAL INFECTION MANIFESTED AS ERYSIPELAS IN PEMPHIGUS FOLIACEUS PATIENT UNDER INTRAVENOUS DEXAMETHASONE TREATMENT

A Nosocomial Infection Manifested as Erysipelas

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ABSTRACT

Introduction: *Puncture wound in diagnostic interventions permits the entry of bacteria into the skin or soft tissue, thus precipitating nosocomial infection, such as erysipelas. There are other risk factors of nosocomial infections including old age, immunosuppressive drugs, and underlying diseases. Pemphigus foliaceus (PF) is an autoimmune disease with corticosteroid treatment as the mainstay therapy, which could cause immunosuppression and predispose patients to infection. The objective of this paper was to report erysipelas as one of the manifestations of nosocomial infection in patients under immunosuppressive therapy.* ***Case:*** *A case of erysipelas acquired on the 9th day of hospitalization in a PF patient underwent intravenous dexamethasone injection, with history of puncture wounds on the previous day on the site of erysipelas was reported. The clinical findings of erysipelas were well defined, painful erythema and edema that felt firm and warm on palpation, with blisters and pustules on top. Gram staining from the pustules and blisters fluid revealed Gram (+) cocci. Patient was given 2 grams intravenous ceftriaxone for 7 days and saline wet compress. Improvement on the erysipelas was seen the day after ceftriaxone injection. The patient was discharged after 12 days of hospitalization with improvement both on the PF and the erysipelas. On the next visit 7 days later, the erysipelas lesion disappeared.* ***Conclusion:*** *Puncture wound and immunosuppresive treatment are the factors that could cause erysipelas as a nosocomial infection, and an appropriate treatment of the infection would decrease the functional disability of the patient.*

Key words: *erysipelas, nosocomial infection, immunosuppresive, pemphigus foliaceous, ceftriaxone*

ABSTRAK

Pendahuluan: *Luka suntikan pada intervensi diagnostik memungkinkan masuknya bakteri ke dalam kulit atau jaringan lunak, sehingga dapat mencetuskan infeksi nosokomial, seperti erisipelas. Faktor risiko lain untuk terjadinya infeksi nosokomial antara lain usia tua, penggunaan obat imunosupresif, dan penyakit yang mendasari. Pemfigus foliaseus (PF) adalah penyakit autoimun dengan pengobatan utama kortikosteroid, yang dapat menyebabkan imunosupresi dan membuat pasien rentan terhadap infeksi. Tujuan tulisan ini adalah untuk melaporkan erisipelas sebagai salah satu manifestasi infeksi nosokomial pada pasien yang mendapatkan terapi imunosupresi.* ***Kasus:*** *Dilaporkan satu kasus erisipelas pada pasien PF yang terjadi pada perawatan di rumah sakit hari ke-9, yang mendapatkan terapi injeksi deksametason intravena, dengan riwayat tusukan jarum sehari sebelumnya pada lokasi erisipelas. Manifestasi klinis erisipelas berupa makula eritema dan edema berbatas tegas, nyeri, teraba keras dan hangat, dengan vesikel serta pustula pada permukaan lesi. Pada pewarnaan Gram yang diambil dari isi vesikel dan pustula didapatkan bakteri kokus Gram (+). Pasien diterapi dengan injeksi seftriakson intravena selama 7 hari dan kompres terbuka dengan larutan salin. Perbaikan pada erisipelas didapatkan satu hari setelah pemberian seftriakson. Pasien dipulangkan pada hari ke 12 perawatan dengan perbaikan baik pada PF dan erisipelasnya. Pada saat kontrol 7 hari kemudian, sudah tidak terdapat lesi erisipelas.* ***Kesimpulan:*** *Luka tusukan dan terapi imunosupresi dapat menjadi faktor penyebab infeksi nosokomial berupa erisipelas. Pengobatan yang tepat pada infeksi tersebut akan mengurangi gangguan fungsional pasien.*

Kata kunci: *erisipelas, infeksi nosokomial, imunosupresi, pemfigus foliaseus, seftriakson*

INTRODUCTION

Nosocomial infections are infections acquired during hospital care, which are not present or incubating at admission, occurring more than 48 hours after admission. Important factors influencing nosocomial infection include old age, immune status, immunosuppressive drugs, underlying disease, injuries to skin, diagnostic and therapeutic interventions.[1]

Skin and soft tissue infections (SSTIs) such as impetigo and erysipelas,[2] are one of the most frequent nosocomial infections found.[1] Erysipelas is usually caused by *Staphylococcus aureus* (*S. aureus*) or beta-hemolytic *Streptococci*.[2] The etiology of SSTIs may be normal host flora transferred through a break in the barrier, such as instrumentation (eg, needles), that could permit the entry of normal skin flora and indigenous flora from the instrument of penetration.[3] Esmaili *et al*.[4] reported that *S. aureus* responsible for 93,7% of skin infections in pemphigus patients.

Pemphigus foliaceus is an autoimmune disorder, with generalized crusts and erosion as clinical findings, and immunosuppressive drugs as the mainstay of treatment.[5] Hospitalization in addition to corticosteroid therapy (with or without adjuvant immunosuppressive agents) would predispose the pemphigus patients to infection, with skin infection as one of the most frequently acquired.[4] This is a case report of nosocomial infection manifested as erysipelas in a patient under immunosuppressive therapy.

CASE

A 57 year-old man was hospitalized at Department of Dermatology and Venereology, Dr. Hasan Sadikin Hospital, Bandung, Indonesia with pemphigus foliaceous (PF). The clinical findings were generalized erythema, superficial loose blisters, erosions, and crusts, that affect 70% of body surface area. Histopathology examination showed subcorneal acantholysis, and direct immunofluorescence revealed intra epidermal IgG deposition, thus the diagnosis was established. The patient was treated with 15 mg intravenous dexamethasone injection daily, along with intravenous ranitidine injection, and antihistamine.

On the 9th day of hospitalization, the patient complained about a painful, erythematous macules and edema on the upper right arm. There was history of repeated needle puncture, due to multiple failed trials of blood aspiration the day before, just below the site of the edema. From the physical examination, besides the generalized erythema and crusts, on the right arm there were irregular, well defined, painful erythema and edema with blisters and pustules on top, measuring 10 x 15 cm, that felt firm and warm on palpation (Figure 1).

The blisters and pustules were aspirated for Gram staining, that revealed Gram (+) cocci and polymorphonuclear cells. Blood examination showed leukocytosis (28,400/mm^3).

Figure 1. Erysipelas lesion

Thus the erysipelas diagnosis was added, and considered as a nosocomial infection. The patient then given 2 grams intravenous ceftriaxone injection daily for 7 days, and wet compress with saline solution was applied to the erysipelas lesion. Improvement on the erythema and edema was seen the day after.

The patient was discharged from the hospital on the 12th day, with improvement on the PF lesions, all the erosions have dried, and most of the crusts dissapeared. The erysipelas lesion was also improved, marked as decreased erythema and edema, and the pain diminished. After discharged from the hospital, the PF treatment was changed into 80 mg methylprednisolone tablet, to be tappered every 7 days. The erysipelas treatment was saline wet compress. Seven days later on the next visit, the PF lesions already became hyperpigmented macules, and the painful erysipelas lesion had already dissapeared.

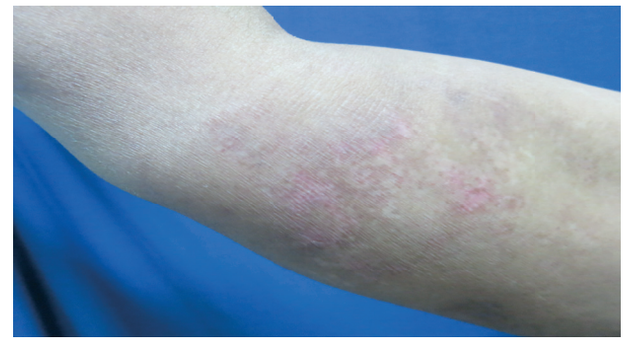

Figure 2. The erysipelas lesion on the final observation, leaving behind hypo pigmented and erythematous macules

DISCUSSION

Skin and soft tissue infection is one of the most frequent nosocomial infections found. Injuries to skin or mucous membranes due to diagnostic or therapeutic interventions could bypass natural defense mechanism of the skin. Other factors including old age that are associated with decreased resistance to infection, and immunosuppressive drugs that may lower the resistance to infection.[1]

Erysipelas is an SSTIs caused by *S. aureus* or beta-hemolytic *Streptococci*,[2] with bimodal incidence

distribution, peaking among young children and the elderly. There is also an increased risk in the immunocompromised, including patients underwent corticosteroid therapy. Erysipelas diagnosis is largely based on clinical findings, and might demonstrate leukocytosis.[6] counted 20,000/mm^3 or more.[7] The unique signs of erysipelas are well-demarcated erythema and edema, of which a diagnosis can be made confidently, and bullae or vesicles may complicate about 5% cases. The most commonly involved site was the leg, followed by the arm, and face.[8]

The clinical findings of erysipelas in this case were tender, well-defined erythema and edema that felt warm on palpation, with blisters and pustules on top. There was also leukocytosis (28,400/mm^3). In this case, erysipelas was considered as nosocomial infection, as the patient acquired it on the 9th day of hospitalization, and there were no signs of infection on admission. The predisposing factors were old age and corticosteroid consumption for PF treatment.

Conditions that lead to disruption in the skin barrier predisposed patients to erysipelas.[8] The etiology of skin and soft tissue infection may be normal host flora, with several means in penetrating the skin barrier. The most common route is through a break in the barrier, such as instrumentation (eg, needles), that could permit the entry of bacteria from the instrument of penetration.[3] In this case, multiple puncture wound from repeated trials of blood aspiration with needle the day before, on the site of erysipelas precipitated the disease.

Antibiotics are the mainstay of treatment for erysipelas and most patients experience a complete recovery after antibiotics and few experience recurrences.[6] A series of antibiotics have been suggested with highly successful clinical response, above 88%.[9] Ceftriaxone is a third generation cephalosporin, with SSTIs as one of the indications.[10] Based on the bacterial susceptibility data to antibiotics in Dr. Hasan Sadikin Hospital, ceftriaxone is still sensitive in 100% cases.[11] Pavlov and Slavova[12] reported that 3rd generation cephalosporin given in a parenteral route for 5–7 days showed good clinical resolution in severe erysipelas. Clinical improvement will be seen in 24-48 hours after treatment initiation, and several days usually needed for disease resolution.[7] In this case, the blisters are aspirated while keeping the roof intact. Intravenous ceftriaxone as the mainstay treatment. The skin lesions improved within 24 hours and complete resolution was seen on the 14th day.

Hospital-acquired infections add to functional disability and emotional stress of the patient and may, in some cases, lead to disabling conditions that reduce the quality of life. Nosocomial infections are also one of the leading causes of death. The economic costs are considerable. The increased length of stay for infected patients is the greatest contributor to cost.[1]

Prevention of nosocomial infections requires integrated, monitored programs, which includes the following key components; 1) limiting transmission of organisms between patients in direct patient care through adequate hand washing and glove use, and appropriate aseptic practice, isolation strategies, sterilization and disinfection practices, and laundry, 2) controlling environmental risks for infection, 3) protecting patients with appropriate use of prophylactic antimicrobials, nutrition, and vaccinations, 4) limiting the risk of endogenous infections by minimizing invasive procedures, and promoting optimal antimicrobial use, 5) surveillance of infections, identifying and controlling outbreaks, 6) prevention of infection in staff members, and 7) enhancing staff patient care practices, and continuing staff education.[13]

As a conclusion, puncture wound and immunosuppresive treatment could cause erysipelas as a nosocomial infection, and an appropriate treatment of the infection would decrease the functional disability of the patient.

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