LETTER TO THE EDITOR

Salvage therapy with intravenous fosfomycin plus ceftriaxone for necrotizing fasciitis caused by penicillin-nonsusceptible Streptococcus pneumoniae

KEYWORDS
ceftriaxone; fosfomycin; necrotizing fasciitis; penicillin nonsusceptible Streptococcus pneumoniae; salvage therapy

To the Editor,

Necrotizing fasciitis (NF) is rarely caused by Streptococcus pneumoniae, and is associated with high morbidity and mortality. Herein, we describe a diabetic patient who presented with NF of an upper extremity and from whom S. pneumoniae was isolated via pus and blood; the clinical condition responded to surgery and antibiotic combinations of ceftriaxone and fosfomycin.

A 62-year-old diabetic man presented with progressively painful swelling of his left shoulder and the upper arm for 7 days. One week before admission, he had fallen on his left shoulder, and received an intramuscular injection of ibuprofen for pain relief. On admission, he was afebrile (35.5°C), with a pulse rate of 70 beats/min, blood pressure of 94/79 mmHg, and respiratory rate of 20 breaths/min. Upon examination, his left shoulder and upper arm was warm, erythematous and painful, with ruptured bullae and thin skin covering the left shoulder. Laboratory studies showed a white blood cell count of 52,700/mm³, and creatinine of 3.7 mg/dL. The diagnosis of NF of the left shoulder and upper arm was made. Intravenous ceftazidime (1 g every 8 hours) and minocycline (200 mg loading dose and 100 mg every 12 hours) were administered. Then he immediately received debridement and fasciotomy of the shoulder and upper arm. A Gram stain of pus revealed encapsulated Gram-positive diplococci. The empiric antibiotics were shifted to ceftriaxone (1 g every 12 h) and fosfomycin (2 g every 6 hours), and this combination therapy was used for a total of 14 days. The culture of blood and tissue were all positive for S. pneumoniae. Antibiotic susceptibility testing of the isolate exhibited minimal inhibitory concentration (MIC) to penicillin of 4.0 μg/mL; ceftriaxone, 0.5 μg/mL; fosfomycin, 4.0 μg/mL; and vancomycin, 1 μg/mL. The S. pneumoniae isolate belonged to serotype 23F, which was determined by latex agglutination (Pneumotest-Latex; Statens Serum Institut, Copenhagen, Denmark). The patient’s NF was improved with ceftriaxone/fosfomycin combination therapy and a total of four surgical debridement sessions.

NF is not uncommon in Taiwan but is rarely caused by S. pneumoniae. The majority of the reported cases had underlying immunocompromising conditions, such as diabetes mellitus, recent use of nonsteroidal anti-inflammatory drugs (NSAIDs), alcohol abuse, liver cirrhosis, postrenal transplantation status, rheumatoid arthritis with immunosuppressant use, systemic lupus erythematosus with immunosuppressant use, and cardiovascular disease. In this case, the patient had two predisposing factors, diabetes mellitus and recent NSAID use.

The antibiotic regimens for streptococcal NF in previously reported articles were diverse. In this study, we performed time-killing studies to evaluate the antibacterial effect of combination regimens with fosfomycin and ceftriaxone. The MIC of fosfomycin was assessed by E test, and ceftriaxone was by microbroth dilution. The combination of 2× MICs of both fosfomycin and ceftriaxone led to a >100-

http://dx.doi.org/10.1016/j.jmii.2016.08.005
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fold decrease in CFU/mL compared with either mono-
therapy with 2\(\times\)MIC or 1\(\times\)MIC of fosfomycin or ceftriaxone or a
combination of both 1\(\times\)MIC fosfomycin and ceftriaxone.

Therefore, the synergistic effect of combination of fosfo-
mycin and ceftriaxone was observed (Fig. 1).

In conclusion, NF can be caused by penicillin non-
susceptible serotype 23F S. pneumoniae in immunocom-
promised hosts; however, surgical intervention with
antibiotic combination therapy of fosfomycin and ceftri-
axone can be one of treatment choice.

Conflicts of interest

None to declare.

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11 July 2016

Available online 18 December 2016