LETTER TO THE EDITOR

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

\textbf{KEYWORDS}

ceftriaxone; fosfomycin; necrotizing fasciitis; penicillin nonsusceptible \textit{Streptococcus pneumoniae}; salvage therapy

\textit{To the Editor},

Necrotizing fasciitis (NF) is rarely caused by \textit{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 \textit{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, erythematic and painful, with ruptured bullae and thin skin covering the left shoulder. Laboratory studies showed a white blood cell count of 52,700/mm$^3$, 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 \textit{S. pneumoniae}. Antibiotic susceptibility testing of the isolate exhibited minimal inhibitory concentration (MIC) to penicillin of 4.0 \,\mu g/mL; ceftriaxone, 0.5 \,\mu g/mL; fosfomycin, 4.0 \,\mu g/mL; and vancomycin, 1 \,\mu g/mL. The \textit{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 \textit{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.\textsuperscript{1-5} 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.\textsuperscript{1-3} 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 \times \text{MICs} of both fosfomycin and ceftriaxone led to a $>$100-
fold decrease in CFU/mL compared with either monotherapy with 2/C2 or 1/C2 MIC of fosfomycin or ceftriaxone or a combination of both 1/C2 MIC fosfomycin and ceftriaxone.

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

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

Conflicts of interest

None to declare.

References


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