

Letter to Editor

Surveillance of Ceftaroline activity against clinical isolates of Methicillin Resistant Coagulase Negative Staphylococci (MRCoNS)

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Abstract:

Ceftaroline, a newer generation cephalosporin has a broad spectrum of activity against many bacterial pathogens including Methicillin resistant staphylococci. This activity is mainly attributed to its increased affinity towards altered penicillin binding proteins of Methicillin resistant isolates. In the present study a total of 50 Methicillin resistant Coagulase negative staphylococci (MRCoNS) were tested against ceftaroline by E strip methodology. All the isolates were inhibited at an MIC of $\leq 3\mu\text{g/ml}$. The MIC 50 and the MIC 90 were $1\mu\text{g/ml}$ and $2\mu\text{g/ml}$ respectively. To conclude, ceftaroline is a promising antibiotic for the treatment of Methicillin resistant Coagulase negative staphylococci

Keywords: MRCoNS, Ceftaroline, E strips

Dear Editor,

Cephalosporins have been the most widely used antibiotics for the treatment of a variety of bacterial infections for the last four decades. Their utility against the Staphylococcal isolates is increasingly being compromised by the higher incidence of Methicillin resistance among staphylococcal isolates. Methicillin resistant staphylococci are resistant to all the β -lactam group of antibiotics because of their altered penicillin binding protein (PBP2a). Ceftaroline is a newer generation cephalosporin recently approved by the USA Food and drug administration for the treatment of community acquired pneumonias, acute bacterial skin and skin structure infections. It is the only cephalosporin

approved till now which has activity against Methicillin resistant staphylococcal isolates. ^(1, 2, 3)

Ceftaroline is a broad spectrum cephalosporin with bactericidal activity against Staphylococcal isolates including MRSA, VISA, Vancomycin resistant *Staphylococcus aureus*, Methicillin resistant and sensitive Coagulase negative staphylococci. The unique activity against Methicillin resistant strains is because of its affinity for PBP2a which distinguishes ceftaroline from other cephalosporins. The activity of ceftaroline against gram negative Enterobacteriaceae is similar to that of 3rd generation cephalosporins. It is not active against ESBL producing Enterobacteriaceae members as well as most of the

nonfermenting gram negative bacilli including *Pseudomonas aeruginosa*.^(4,5)

In the present study a total of 50 clinically significant non repetitive isolates of Methicillin resistant Coagulase negative staphylococci obtained from various clinical specimens were included. The organisms were identified by standard laboratory procedures. Methicillin resistance was detected by Kirby Bauer disc diffusion method using cefoxitin 30 µg on Mueller Hilton agar. All these resistant isolates were tested against ceftaroline by E strip (Biom-

erieux) methodology on Mueller Hinton agar. Minimum inhibitory concentration zones were measured and interpreted as per CLSI guidelines by adopting *S.aureus* breakpoints. *S.aureus* ATCC 29213 was used as control strain.⁽⁶⁾

All the isolates were uniformly sensitive to ceftaroline. The MIC₅₀ and the MIC₉₀ were 1 µg/ml and 2µg /ml respectively. The least MIC observed in our study was 0.25µg/ml and highest MIC was 3 µg/ml and 98 % of the staphylococcal isolates were inhibited at an MIC ≤2 µg/ml

MIC values	0.25	0.38	0.50	0.75	1.0	1.5	2	3	>3
Percentage of isolates	4%	6%	16%	12%	28%	18%	14%	2%	0%

Coagulase negative staphylococci are increasingly being isolated as pathogenic organisms from clinical specimens. Very high incidence of Methicillin resistance among Coagulase negative staphylococci has left with only few alternatives available for the treatment. As these alternatives have their own set of clinical limitations and side effects, safer drugs need to be investigated and added to the existing therapeutic armamentarium. Ceftaroline is one such drug with good activity against MRCoNS.

Only very few ceftaroline surveillance studies are conducted among coagulase negative staphylococci in the world. In a study conducted by Jones et al⁽⁷⁾, a large number of Coagulase negative staphylococcal isolates obtained from both USA and European Medical Centers were tested against ceftaroline. All the USA isolates were inhibited at

MIC of 2 µg/ml whereas all the European isolates were inhibited at a ceftaroline MIC of 4 µg/ml. Our study results correlate with Jones et al study with all the isolates being inhibited below 4 µg/ml. In the same study MIC₅₀ and MIC₉₀ for the USA isolates were 0.25 µg/ml and 0.5 µg/ml , whereas for European isolates it was 0.25 µg/ml and 1.0 µg/ml. 98.2 % of the European isolates were inhibited at an MIC ≤ 2µg/ml which is similar to our study where 98% of the isolates were inhibited at MIC ≤ 2µg/ml. To conclude, ceftaroline is a highly active drug against methicillin resistant coagulase negative staphylococci and can be used as a safe and effective drug for the treatment of these resistant infections. With the continuous surveillance and following strict antimicrobial policies, the utility of the ceftaroline can be preserved for the future.

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