Meropenem and cloxacillin are active against MRSA clinical isolates (including VISA) in acidic broth and in THP-1 macrophages.

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Abstract

Objectives: Exposure of Methicillin-resistant S. aureus (MRSA) to acidic pH restores its susceptibility to beta-lactams. (Gulati et al. JAC, 1997). In macrophages, S. aureus is mostly confined within phagosomal compartments where the pH is acidic. We showed that meropenem (MEM) displays similar intracellular activity against MRSA ATCC 25923 and MSSA ATCC 25923 in macrophages in the presence of antimicrobial agents. Here, we investigated the influence of acid pH on the activity of MEM and CLX against MSSA and MRSA and on the expression of mecA.

Aim of the study

• To study the influence of acid pH on the activity of MEM and CLX against MSSA and MRSA and on the expression of mecA
• To determine the intracellular activity of MEM and CLX

Methods

• Susceptibility was assessed by broth micro-dilution method, in MHB supplemented with NaCl 2 % and adjusted to pH 7.4 or 5.5.
• Intracellular activity was studied in THP-1 macrophages, in the presence of 25923, 100 mg/L for 24 h from the original, and phagolysosomal compartments [5]. Results: The table shows the MICs (in broth) of neutral and acid pH and the intracellular activity for the 3 strains studied.

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<thead>
<tr>
<th>Strain</th>
<th>pH 5.5 MIC (mg/L)</th>
<th>pH 7.4 MIC (mg/L)</th>
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<tbody>
<tr>
<td>MSSA</td>
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Results

• Intracellular activity was assessed in human THP-1 macrophages exposed to extracellular and intracellular activity against MSSA and MRSA clinical isolates (including VISA strain). In comparison with the reference MRSA (ATCC 33591) and MSSA (ATCC 25923) strains.

Conclusions:

• Intracellularly, MEM and CLX are as active against MSSA and MRSA tested, including a VISA strain.

References


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