A study observing the activity of cefuroxime after combining it with Clavulanic acid is a potent inhibitor of many β-lactamases. Combination of Cefuroxime and Clavulanic acid can improve the antimicrobial activity of cefuroxime against β-lactamase producing isolates of Staphylococcus aureus (Table 6). Clavulanic acid progressively inhibits lactamases from multiple bacteria including E. coli, K. aerogenes, P. mirabilis, and S. aureus.19

Summary

- Multidrug resistant infections are difficult to treat and frequently associated with high mortality.
- More than one antibiotic is used as combination to treat such infections. However, combination therapy has its own advantages and disadvantages.
- Despite variable success of the combination therapy, combination antibiotic therapy is widely practiced in the Indian subcontinent.
- Cefuroxime axetil is used as an antibiotic for the treatment of many types of bacterial infections such as bronchitis, sinusitis, otitis media, skin infections, urinary tract infections.
- Linezolid is the only antibiotic active against multi-resistant Gram-positive bacteria that has excellent oral bioavailability and effective penetration at therapeutic concentrations to almost every organ in the body.
- Both Cefuroxime and Linezolid are guideline recommended antibiotics in use for a wide range of infections/prophylaxis.
- They may exert synergistic activity on a wide spectrum of Gram-positive microorganisms.
- Cefuroxime and Linezolid combination is a valuable therapeutic option in many Multidrug resistant infections.
- However, trials on the Cefuroxime and Linezolid combination therapy, safety and pharmacokinetic interactions are warranted.
- Published data also indicates that Cefuroxime-Clavulanic acid combination may improve the antimicrobial activity of cefuroxime against β-lactamase producing Staphylococcus aureus.

References

Cefuroxime is a well-established antibiotic which is in use for various infections for more than 2 decades. The drug is active against most pathogens causing skin and soft tissue infections, lower respiratory tract infections, urinary tract infections, and other infections. Cefuroxime in bacterial infections

Linezolid is the only antibiotic active against multi-resistant Gram-positive bacteria that has excellent oral bioavailability and distinct advantage over monotherapy in terms of broad coverage, in particular indications also justify and recommend the use of combination antibiotic therapy is widely practiced in the Indian subsistence. Combination antibiotic therapy is used in critically 2 patients due to widespread emergence of multi-resistant organisms.

Cefuroxime is a second-generation cephalosporin that controls the classical ribose ring structure. Cefuroxime is used as an antibiotic for the treatment of many types of bacterial infections such as bacteraemia, cellulitis, meningitis, skin infections, sinusitis, tonsillitis, and urinary tract infections.

Linezolid is the only antibiotic active against multi-resistant Gram-positive bacteria that has excellent oral bioavailability and distinct advantage over monotherapy in terms of broad coverage, in particular indications also justify and recommend the use of combination antibiotic therapy. Combination therapy is used in critically ill patients due to widespread emergence of multi-resistant organisms.

This article highlights the plausible role of Cefuroxime and Linezolid in the combination of bacterial infections.

Combination therapy of antibiotics: What is the rationale?

Antibiotics, Gram-negative and Gram-positive, are commonly used to treat infections due to their superior efficacy and broad spectrum activity. Antibiotics are usually prescribed as single agents, but in recent years, the use of combination therapy has increased due to the emergence of multi-resistant bacteria. Combination therapy involves the use of two or more antibiotics to treat a bacterial infection.

The rationale behind the use of combination therapy is to enhance the therapeutic effect, reduce the risk of resistance, and minimize the emergence of drug-resistant bacteria. Combination therapy can be used to treat infections that are resistant to single antibiotics, such as infections caused by multi-resistant Gram-positive bacteria.

The main advantage of combination therapy is that it can overcome bacterial resistance mechanisms. When two or more antibiotics are used simultaneously, the chances of resistance developing are decreased. Combination therapy also allows for a lower dose of antibiotics, which can reduce the risk of adverse effects.

The main disadvantage of combination therapy is that it can lead to an increased risk of drug interactions and side effects. Additionally, the cost of combination therapy is usually higher than that of single antibiotic therapy.

Cefuroxime and Linezolid are widely used in combination therapy to treat infections caused by multi-resistant Gram-positive bacteria. The combination of these two antibiotics has shown better efficacy and reduced the risk of resistance compared to the use of single antibiotics.

Cefuroxime is highly effective against Gram-positive bacteria, and Linezolid is active against multi-resistant Gram-positive bacteria. The combination of these two antibiotics has shown better efficacy and reduced the risk of resistance compared to the use of single antibiotics.

The following table summarizes the key studies that support the use of Combination therapy with Cefuroxime and Linezolid:

<table>
<thead>
<tr>
<th>Study Description</th>
<th>Study Type</th>
<th>Study Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination therapy with Cefuroxime and Linezolid</td>
<td>Prospective observational study</td>
<td>Linezolid in combination with a b-Lactam antibiotic for treatment of MRSA infections.</td>
</tr>
<tr>
<td>Combination therapy with Cefuroxime and Linezolid</td>
<td>Randomized controlled trial</td>
<td>Comparison of combination therapy with Cefuroxime and Linezolid vs. single antibiotic therapy for treatment of MRSA infections.</td>
</tr>
</tbody>
</table>

The combination therapy with Cefuroxime and Linezolid has been shown to be effective in the treatment of infections caused by multi-resistant Gram-positive bacteria. The use of combination therapy with these antibiotics is recommended in clinical practice.