

In vitro synergistic activity of lysostaphin combined with linezolid against methicillin resistant *Staphylococcus aureus*

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Antimicrobial combination therapy is used to provide broad-spectrum coverage, prevent the emergence of resistant mutants. Bactericidal activity of antibiotics is considered important in the treatment of severe infections and use of combinations of antibiotics with synergistic mechanism is recommended. In the present study we have tested for synergistic activity of lysostaphin with linezolid against methicillin resistant *Staphylococcus aureus* (MRSA) isolates. Ten MRSA isolates which had oxacillin MIC (Minimum Inhibitory Concentration) >64µg/ml were selected for study. Synergistic activity was determined by checker board methods in micro titer trays with cation-supplemented Mueller-Hinton broth. Lysostaphin (0.125 to 8µg/ml) was tested with the combination of linezolid (0.015 to 2µg/ml). Fractional inhibitory concentrations (FICs) were interpreted as synergistic when values were ≤0.5, as additive or indifferent when values were >0.5 to 4.0, and as antagonistic when values were >4.0. Lysostaphin showed synergistic activity with linezolid at 1µg/ml concentration. FIC indices ranged between 0.375 to 0.5. Synergistic activity was observed in all of the strains tested with the combination of 1 µg/ml of lysostaphin with 0.25µg/ml of linezolid. Linezolid plays an important role in the treatment of infections due to MRSA strains. Despite the reported low frequencies of mutation to linezolid *in vitro*, the development of resistance among both *Enterococcus* and *Staphylococcus* species strains during linezolid therapy has been described previously. As lysostaphin causes rapid lysis of bacterial cells, combination therapies that include linezolid and lysostaphin could be used in the future in life threatening infections such as endocarditis to increase the early *in vivo* activity of the drugs and to prevent emergence of linezolid resistant mutants.

Biography

Indira Bairy, Professor of Microbiology has completed MD Microbiology in the year 1990 from Mangalore University and working as faculty at Manipal University. She has more than 100 publications in national and international indexed journals. She has more than 100 conference presentations and she is the reviewer for national and international journals. She has guided MD and PhD students.

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