Antimicrobial activities of Alfasid against clinical isolates from upper respiratory tract infections

D. Patel*
Department of chemistry, Naik P Mahavidyalaya, Erakhna, 754107, India E-mail: dpatel@yahoo.com

Alfasid is a mutual prodrug in which ampicillin and a potent beta-lactamase inhibitor sulbactam are ester-bound in an equimolar ratio. Alfasid is hydrolyzed during absorption after oral administration to provide ampicillin and sulbactam for systemic circulation. In the present study, the antimicrobial activities of Alfasid against 50 isolates each of 6 species (Staphylococcus aureus, Klebsiella pneumoniae subsp. pneumoniae, Branhamella catarrhalis, Haemophilus influenzae, Streptococcus pneumoniae and Streptococcus pyogenes) of bacteria freshly obtained from upper respiratory tract infections were examined in relation to their bacterial beta-lactamase producing abilities. beta-Lactamase producing strains were identified using the acidometry disc method with benzylpenicillin as a substrate, and their frequencies of appearance were calculated as follows: S. aureus 86%; K. pneumoniae subsp. pneumoniae 100%; B. catarrhalis 68%; H. influenzae 24%. Fourteen per cent of S. aureus strains examined were beta-lactamase positive using both benzylpenicillin and cefazolin acidometry discs. Alfasid, however, demonstrated excellent antimicrobial activities even against these beta-lactamase producing strains. Good activities were observed especially against those bacterial strains producing penicillinase (PCase). Average MIC80 values of Alfasid were 3.13 micrograms/ml for S. aureus and K. pneumoniae subsp. pneumoniae, 0.39 micrograms/ml for B. catarrhalis and H. influenzae, 0.05 micrograms/ml for S. pneumoniae and 0.025 micrograms/ml for S. pyogenes. As Alfasid was shown to possess excellent antimicrobial activities against PCase producing strains, the enhancement in activities of Alfasid compared to ampicillin alone can be attributed to the inhibition of beta-lactamase by sulbactam which, as noted above, is a component of Alfasid in an equimolar ratio to ampicillin.

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