

Activity of Commonly Used Intravenous Nutrient and Bisolvon in Neonatal Intensive Care Units against Biofilm Cells and Their Synergetic Effect with Antibiotics

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Abstract : The purpose of this study was to investigate the efficacy of intravenous nutrient (soluvit, vitalipid, aminoven infant, lipovenos) and bisolvon commonly used in neonatal intensive care units against biofilm cells of staphylococcus aureus, Staphylococcus epidermidis, Pseudomonas aeruginosa and klebsiella pneumonia as they are the most commonly isolated organisms and are biofilm producers. Also, the synergetic activity of soluvit, heparin, bisolvon with antibiotics and its effect on minimum biofilm eradication concentration (MBEC) was tested. Intravenous nutrient and bromohexine are widely used in newborns. Numbers of viable cell count released from biofilm after treatment with intravenous nutrient and bromohexine were counted to compare the efficacy. The percentage of reduction in biofilm regrowth in case of using soluvit was 43-51% and 36-42% for Gram positive and Gram negative respectively, on adding the vitalipid the percentage was 45-50% and 37-41% for Gram positive and Gram negative respectively. While, in case of using bisolvon the percentage was 46-52% and 47-48% for Gram positive and Gram negative respectively. Adding lipovenos had a reduction percentage of 48-52% and 48-49% for Gram positive and Gram negative respectively. While, adding aminoven infant the percentage was 10-15% and 9-11% for Gram positive and Gram negative respectively. Adding soluvit, heparin and bisolvon to antibiotics had synergic effect. soluvit with ciprofloxacin has 8-16 times decrease than minimum biofilm eradication concentration (MBEC) for ciprofloxacin alone. While, by adding soluvit to vancomycin the MBEC reduced by 16 times than MBEC of vancomycin alone. In case of combination soluvit with cefotaxime, amikacin and gentamycin the reduction in MBEC was 16, 8 and 6-32 times respectively. The synergetic effect of adding heparin to ciprofloxacin, vancomycin, cefotaxime, amikacin and gentamicin was 2 times reduction with all except in case of gram negative the range of reduction was 0-2 with both gentamycin and ciprofloxacin. Bisolvon exhibited synergetic effect with ciprofloxacin, vancomycin, cefotaxime, amikacin and gentamicin by 16, 32, 32, 8, 32-64 and 32 times decrease in MBEC respectively.

Keywords : biofilm, neonatal intensive care units, antibiofilm agents, intravenous nutrient

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