

Novel material for medical use based on Ag-zeolite/polyvinyl chloride composite

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Introduction

The aim of this work was to study antibacterial activity of silver-exchanged natural clinoptilolite/polyvinyl chloride composites (AgZ/PVC) toward clinical isolates of *Acinetobacter baumannii*, which causes various nosocomial infection. Polyvinyl chloride (PVC) mostly used for endotracheal tubes usually acts as a reservoir for bacteria causing infections with a high level of mortality.

Experimental

AgZ containing 44 mg Ag/g (AgZ) was added in a solution of PVC (1 g) in tetrahydrofuran (20 cm³) at different percentages (0, 5, 10 and 15 wt. %). The mixtures were left to dryness in a vacuum dryer and the obtained films were divided in two series: A – coated by D-Tyrosine and B – uncoated. Antibacterial activity of A and B composites were tested against clinical isolates of *A. baumannii* ST 145.

Results and Conclusions

The number of immobilized *A. baumannii* does not depend on AgZ amount for the both series of the composites. The percent of reduction showed dependence of composite coating: 100% reduction was found for the A series indicates its bactericidal effect towards *A. baumannii* whereas for B series the reduction was about 70%. The reduction of planktonic bacteria increases with the increase of AgZ in B series: 62.8% was evident for composite with 5 wt.% AgZ and 73.6 % for that one with 15 wt.%. For the A series the reduction did not change significantly with AgZ content (being about 65%). The results indicate that AgZ/PVC composite is a promising material for further clinical investigation and medical applications.

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