

Evaluation of elution and mechanical properties of high-dose antibiotic-loaded bone cement: comparative "in vitro" study of the influence of vancomycin and cefazolin

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Abstract— Use of antibiotic-loaded bone cements is one of the most effective methods for the prevention and treatment of prosthetic joint infection. However, there is still controversy about the optimal combination and doses of antibiotics that provide the maximum antimicrobial effect without compromising cement properties. In this study, vancomycin and cefazolin were added to a bone cement (Palacos R + G). Antibiotic release, fluid absorption, and mechanical properties were evaluated under physiological conditions. The results show that the type of antibiotic selected has an important impact on cement properties. In this study, groups with cefazolin showed much higher elution than those containing the same concentration of vancomycin. In contrast, groups with cefazolin showed a lower strength than vancomycin groups.

Index Terms— bone cement-PMMA; antibiotic; elution; water uptake; mechanical properties

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