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Effects of vancomycin, cefazolin and test conditions on the wear behavior of bone cement

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Abstract— Antibiotic cement has been recommended in the treatment of prosthetic infections. The purpose of this study was to investigate the mechanical behavioral changes in cement loaded with two antibiotics, vancomycin and cefazolin, in dry and liquid medium. Six groups and four study conditions were established according to the doses of antibiotic used and the ageing (immersion in phosphate buffered saline) of the samples. Properties evaluated were friction coefficient and wear. Samples in dry medium showed higher wears than in liquid. Antibiotic selection did not influence wear properties tested in dry conditions, however, in liquid medium, there were higher frictional coefficients and wear for cefazolin loaded cement after one week and for vancomycin and cefazolin after one month. The results suggest that antibiotic cements behave differently in liquid and that the molecular characteristics of antibiotics are essential for determining this influence.

Index Terms— polymethylmethacrylate (PMMA), bone cement, friction, arthroplasty infection, antibiotic-loaded cement

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