

## **MECHANICAL EFFECTS OF THE USE OF VANCOMYCIN AND MEROPENEM IN ACRYLIC BONE CEMENT.**

**Persson C, Baleani M, Guandalini L, Tigani D, Viceconti M.**

Laboratorio di Tecnologia Medica, Istituti Ortopedici Rizzoli. Bologna, IT-401 36. Italy.

**Background** The increasing resistance of certain bacteria to antibiotics commonly used in bone cements has led to a demand for alternative antibacterial agents. The antibiotics added to bone cements may, however, have detrimental effects on the mechanical properties of the cement. **Material and methods** We evaluated the mechanical effects of adding vancomycin and meropenem to bone cement by compression, bending and fatigue tests. **Results** Addition of vancomycin at a concentration of up to 2.5% (w/w) had no effect on the compressive strength. Bending and fatigue strength were negatively affected by vancomycin but not by meropenem. **Interpretation** A cement containing 1.25% vancomycin and 1.25% meropenem might be an interesting compromise between the introduction of antibacterial properties and preservation of the mechanical properties. With this concentration of additives the compressive strength and the fatigue strength remain unchanged, while the bending strength (-14%) and the bending modulus (-9%) are only slightly reduced and remain above the limits set by the ISO5833 standard.