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Induction of experimental endophthalmitis in rabbits and liposome encapsulated vancomycin treatment: a pilot study

Authors: Luiz Felipe Hagemann, Paulo Henrique Morales, José Augusto Cardillo, Rogério Alves Costa, Ana Luiza Hofling-Lima, Michel Eid Farah. Purpose: To evaluate the effectiveness of Staphylococcus aureus experimental endophthalmitis induction, and the culture results after treatment with liposome-encapsulated vancomycin and vancomycin only.

Materials and Methods: Eighteen rabbits were divided into 3 groups. Rabbit eyes were rendered aphakic by means of phacoemulsification, and three weeks postoperatively, approximately 104 S. aureus colony forming units obtained after serial dilution were injected into the vitreous cavity. Twenty-four hours after bacterial injection, two different treatment groups were created and randomized for comparison. In groups V (n = 6), vancomycin hydrochloride 1 mg in 0.1 cc of diluent was injected into the midvitreous cavity. In group E (n = 6), liposome encapsulated vancomycin was injected as in group V. Group S (n = 6) was maintained as a control and received only saline injection as described above in the other groups. Eyes were examined clinically and samples for culture obtained 3 and 9 days after inoculation.

Results: Clinical endophthalmitis developed in all eyes in Groups E, V, and S. One animal of group V died 2 days after inoculation. Bacterial growth in Groups E, V, and S 3 days after inoculation were 2/6, 3/5 and 6/6 eyes, respectively. After 9 days of inoculation 7 animals had spontaneous eye perforation: 2/6, 1/5 and 4/6 in groups E, V, and S respectively; positive culture results were 3/6, 1/5 and 4/6 groups E, V, and S respectively.

Conclusions: the aphakic model of endophthalmitis induction is effective. High concentration of bacteria used may have lead to eye perforation after severe tissue destruction. This fact could distort the culture results 9 days after inoculation.