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Therapy with hyperbaric oxygen and cefazolin for experimental osteomyelitis due to Staphylococcus aureus in rats

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Résumé / Abstract

Hyperbaric oxygen (HBO[2]) is used as adjunctive therapy for chronic osteomyelitis, yet its efficacy remains controversial. A recently developed rat model for osteomyelitis due to Staphylococcus aureus was used to compare the results of treatment with HBO[2], cefazolin, a combination of both, or no treatment. For the induction of tibial osteomyelitis, S. aureus was inoculated into the medullary cavity. Arachidonic acid was used as the sclerosing agent. With that procedure, an infection rate of 96% was attained. For long-term antibiotic treatment, a port system was developed and implanted. Hyperbaric treatment alone reduced the colony-forming units (CFU) from $2.9 \times 10[6]$ to $6.2 \times 10[5].g[-1]$ of tibial bone. The effect on the infection was more pronounced with antibiotic therapy alone; $10.5 \times 10[4]$ CFU per g of tibial bone were measured. However, changes were most marked using a 4-wk combination therapy consisting of HBO[2] and an antibiotic agent. The colony count was $2.7 \times 10[3]$ CFU. Each of the treatment modalities resulted in a significant therapeutic effect. The results not only demonstrated the effectiveness of HBO[2] in the treatment of osteomyelitis, but revealed a potential additive effect with the combination of HBO[2] and an antibiotic.

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