Active and Passive Immunization Against Staphylococcus aureus Periprosthetic Osteomyelitis in Rats

Background/Aim: Staphylococcus aureus infection associated with orthopedic implants cannot always be controlled. We used a knee prosthesis model with implant-related osteomyelitis in rats to explore induction of an effective immune response with active and passive immunization. Materials and Methods: Fifty-two Sprague-Dawley rats were divided into active (N=28) and passive immunization groups (N=24). A bacterial inoculum of 10^{3} S. aureus MN8 was injected into the tibia and the femur marrow before insertion of a non-constrained knee prosthesis in each rat. The active-immunization group received a synthetic oligosaccharide of polysaccharide poly-N-acetylglucosamine (PNAG), 9G1cNH(2) and the passive-immunization group received immunization with immunoglobulin from rabbits infected with S. aureus. Results/Conclusion: Active immunization against PNAG significantly reduced the consequences of osteomyelitis infection from PNAG-producing intercellular adhesion (ica(+)) but not ica(-) S. aureus. Passive immunization resulted in better clinical assessments in animals challenged with either ica(+) or icaS. aureus, suggesting a lack of specificity in this antiserum.

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