

Phage Therapy of Staphylococcal Pyoderma in Dogs

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Abstract : Staphylococcus intermedius/pseudintermedius bacteria are commonly found on the skin of healthy dogs and can cause pruritic skin diseases under certain circumstances (trauma, allergy, immunodeficiency, ectoparasitosis, endocrinological diseases, glucocorticoid therapy, etc.). These can develop into complicated superficial or deep pyoderma, which represent a large group of problematic skin diseases in dogs. These are predominantly inflammations of a secondary nature, associated with the occurrence of coagulase-positive Staphylococcus spp. A major problem is increased itching, which greatly complicates the healing process. The aim of this work is to verify the efficacy of the developed preparation Bacteriophage SI (Staphylococcus intermedius). The tested preparation contains a lysate of bacterial cells of S. intermedius host culture including culture medium and live virions of specific phage. Sodium Merthiolate is added as a preservative in a safe concentration. Validation of the efficacy of the product was demonstrated by monitoring the therapeutic effect after application to indicated cases from clinical practice. The indication for inclusion of the patient into the trial was an adequate history and clinical examination accompanied by sample collection for bacteriological examination and isolation of the specific causative agent. Isolate identification was performed by API BioMérieux identification system (API ID 32 STAPH) and rep-PCR typing. The suitability of therapy for a specific case was confirmed by in vitro testing of the lytic ability of the bacteriophage to lyse the specific isolate = formation of specific plaques on the culture isolate on the surface of the solid culture medium. So far, a total of 32 dogs of different sexes, ages and breed affiliations with different symptoms of staphylococcal dermatitis have been included in the testing. Their previous therapy consisted of more or less successful systemic or local application of broad-spectrum antibiotics. The presence of S. intermedius/pseudintermedius has been demonstrated in 26 cases. The isolates were identified as a S. pseudintermedius, in all cases. Contaminant bacterial microflora was always present in the examined samples. The test product was applied subcutaneously in gradually increasing doses over a period of 1 month. After improvement in health status, maintenance therapy was followed by application of the product once a week for 3 months. Adverse effects associated with the administration of the product (swelling at the site of application) occurred in only 2 cases. In all cases, there was a significant reduction in clinical signs (healing of skin lesions and reduction of inflammation) after therapy and an improvement in the well-being of the treated animals. A major problem in the treatment of pyoderma is the frequent resistance of the causative agents to antibiotics, especially the increasing frequency of multidrug-resistant and methicillin-resistant S. pseudintermedius (MRSP) strains. Specific phagolysate using for the therapy of these diseases could solve this problem and to some extent replace or reduce the use of antibiotics, whose frequent and widespread application often leads to the emergence of resistance. The advantage of the therapeutic use of bacteriophages is their bactericidal effect, high specificity and safety. This work was supported by Project FV40213 from Ministry of Industry and Trade, Czech Republic.

Keywords : bacteriophage, pyoderma, staphylococcus spp, therapy

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