The use of Antiseptics in Veterinary Dermatology

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Utilizzo dei prodotti antisettici in dermatologia veterinaria
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The recent development of multi-resistant bacteria in veterinary medicine, especially methicillin-resistant staphylococci, highlights a need for alternative therapeutic approaches able to eliminate bacterial strains that are virtually resistant to all oral antibiotics, while minimising further selection of antibiotic-resistant strains. Among the various recommendations made by experts in the veterinary field (1), topical use of antimicrobial products, including antiseptics, seems the simple and effective treatment for surface skin multi-resistant bacterial infections. Besides clinical efficacy, local antimicrobial treatment limits the spread of these bacteria, thus reducing the need for last-resort broad-spectrum systemic antibiotics, which are the main cause behind the spread of antibiotic-resistant bacteria. In veterinary dermatology, situations in which topical antiseptic treatment is a valid alternative to systemic antibiotic therapy are frequent (2, 3). These situations include otitis externa and some forms of surface pyoderma (which only present bacterial overgrowth) such as intertrigo or pyotraumatic dermatitis, and localised surface pyoderma such as mucocutaneous pyoderma.

The use of antiseptics that possess antibacterial properties presents many advantages compared to systemic antibiotic therapy. These advantages can be summarised in the five points listed below.

1) Clinical efficacy towards multi-resistant bacterial strains.
Antiseptics target microorganisms by mechanisms of action that differ from those of antibiotics. Studies in human medicine have found that antiseptic products have the same efficacy against bacteria that are resistant and sensitive to antibiotics. For instance, various studies on methicillin-resistant Staphylococcus aureus (MRSA) have proved that methicillin-resistance does not influence susceptibility to chlorhexidine (4), which is currently used successfully to decolonise MRSA in humans (5).

Local antimicrobial treatment is an alternative or complimentary approach to antibiotic treatment of methicillin-resistant S. intermedius infections that have recently emerged in small animals. (6)
2) Broad spectrum antimicrobial action.
While antibiotics, even the broad-spectrum ones, possess a limited spectrum of activity (i.e. cephalosporins are not active against Pseudomonas aeruginosa and Malassezia), some antiseptics such as chlorhexidine and phytosphingosine are microbicidal against almost all the main pathogens in veterinary dermatology, including staphylococci, streptococci, gram-negative rods (with the sole exception of certain P. aeruginosa strains) and yeasts. The choice of antiseptics is therefore particularly advantageous in the treatment of mixed infections that involve various bacterial species and microorganisms. This phenomenon is rather common in otitis externa in dogs and infected wounds.

3) Complimentary non-antimicrobial properties.
Most antiseptics possess secondary beneficial properties in addition to their antimicrobial action. Chlorhexidine’s emollient property is useful for dry and dehydrated skin. Benzoyl peroxide is a keratolytic, antipruritic and degreasing agent. Phytosphingosine is a natural component of the cornal layer; it guarantees epidermal barrier function with keratomodulating effects and by controlling sebum production, besides performing a local antiinflammatory action. Tris-EDTA has a synergic action with various antibiotics, and it is highly recommended for infections caused by gram-negative rods. The synergic effect seems to issue from a series of mechanisms related to the increase in pH and kelation of divalent cations.

Moreover, Tris-EDTA increases sensitivity in P. aeruginosa strains resistant to fluoroquinolones, most likely by inhibiting their resistance mechanism. Hence, cases of otitis externa associated with resistant strains can be successfully treated by combining Tris-EDTA and chlorhexidine for topical administration. This combination is synergetic and, therefore, allows the use of low doses of chlorhexidine (0.15%) that are not ototoxic. (7, 8, 9)

4) Low impact on the spreading of resistance.
According to the current scientific knowledge, antiseptics do not seem to directly enhance selection of antibiotic resistance and, above all, bacteria do not seem to acquire resistance to the antiseptic concentrations used for topical treatment. Though bacterial strains that have acquired resistance to antiseptics and disinfectants have been detected, this phenomenon does not seem to be of clinical importance since the antiseptic concentrations used in clinical practice are notably higher than those required to eliminate “resistant” strains. (4, 10, 11)
5) **Action circumscribed to the site of the infection.**

Antiseptics are not absorbed in the blood stream and solely act on the site of infection. Hence, most antiseptics have no secondary effects on animal health. Instead, antibiotics are a frequent cause of side-effects such as vomiting, diarrhoea, allergies, etc. Moreover, unlike oral antibiotics, antiseptics do not influence the composition of intestinal microflora, for instance by selecting pathogenic bacteria such as *Clostridium difficile* or by encouraging the development of antibiotic-resistance in opportunistic pathogens like *Escherichia coli* and *Enterococcus faecium*.

All antiseptic products must be used following the indications and the concentrations indicated in the product leaflet.

The product’s clinical efficacy is ensured by close compliance with exposure times and by educating owners to strictly follow the application times and frequency recommended in the veterinary prescription. To avoid product contamination, all dilutions must be prepared with sterile water, and solutions must be stored as specified according to the manufacturer’s instructions. Although Tris-EDTA has a synergic effect when combined with certain antibiotics, it would be wrong to stretch this property to all antiseptic products.

This article highlights the advantages of using antiseptics in veterinary dermatology but it also aims at promoting their rational and appropriate use.
References


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