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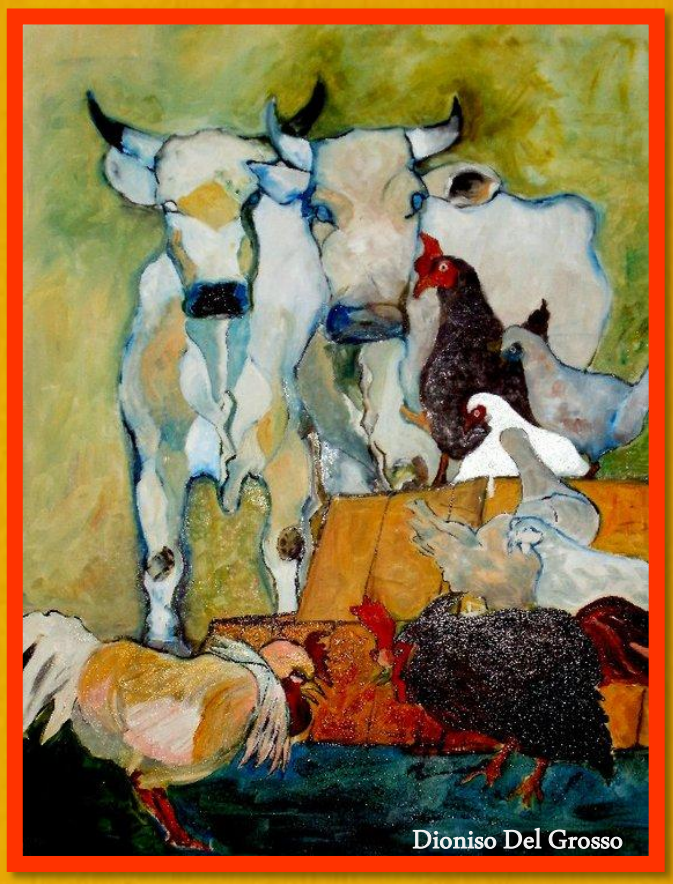

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OZONE EYEDROPS FOR BACTERIAL KERATITIS IN ANIMALS: A CASE SERIES

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Bacterial keratitis and in turn conjunctivitis is one of the commonest anterior segment disorders encountered in animals and humans, traditionally managed with topical instillation of antibacterial, non-steroidal anti-inflammatory and anti-collagenase agents [1]. A topical dosage of one or two drops of collyrium every 4 hours over three to seven days is recommended, even though resolution multiple and frequent instillation are often required to achieve clinical [1]. Due to the increasing loss of antimicrobic drug efficacy related to their overuse and the appearance of multi-drug resistant bacterial strains, the research has been driven towards the study of new antimicrobial agents, possibly also equipped with anti-inflammatory effect [2]. Ozonated liposomal dispersions have the same properties of gaseous ozone, are well tolerated by biological tissues and have biological properties as antimicrobial activity, wound healing promotion and oxidative stress protection [3]. The purpose of this case series is to describe the use of liposomal ozone dispersion in spontaneous bacterial keratitis in animals. A horse, a cat and a dog spontaneously affected by bacterial keratitis received topical application of liposomal ozone dispersion (Ozodrop®; FB Vision, Ascoli Piceno, Italy) three times a day until clinical remission of symptoms. All patients well tolerated the therapy and completely recovered from the conditions in a time comparable to the standard therapy. All ozone activities are related to oxygenated compounds that are able to eliminate pathogens by direct oxidation mediated by hydrogen peroxide and lipoperoxyde, and selective cytotoxicity on fast dividing cells, through bacterial lysis and cell death, negative regulation on mitochondrial activity in yeast and mould and disturbance on virus lytic enzymes activity [4]. Moreover, ozone promotes wound healing by releasing oxygen (O2), platelet-derived growth factor (PDGF) and transforming grow factor β (TGF-β) [5]. This preliminary study suggests that liposomal ozone dispersion may be effective for the treatment of bacterial keratitis in animals, having bactericidal and anti-inflammatory activity, in addition to promoting tissue repair effect. All of these therapeutic effects are contained in a unique ocular preparation stable over time reducing the risk of loss of patient and owner compliance. Topical treatment with ozone liposomal dispersion may avoid or reduce the need for topical antimicrobial drugs, preventing the emergence of bacterial resistance.

[1] Hendrix DVH. Diseases and Surgery of the Canine Conjunctiva and Nictitating Membrane. In: Kirk N. Gelatt, ed. Veterinary Ophthalmology. V ed. Blackwell Publishing; 2013. [2] Baeyens V, Felt-Baeyens O, Rougier S et al. Clinical evaluation of bioahdesive opthalmic drug insert (BODI) for the treatment of external ocular infections in dogs. Journal of Controlled Release, 85:163-8, 2002. [3] Sechi LA, Lezcano I, Nunez N et al. Antibacterial activity of ozonized sun-ower oil (Oleozon). Journal of Applied Microbiology, 90:279-284, 2001. [4] Valacchi G, Lim Y, G. Belmonte et al., Ozonated sesame oil enhances cutaneous wound healing in SKH1 mice. Wound Repair and Regeneration. 2011;19:107–115, 2011. [5] Hee SK, Noh SU, Han YW et al. Therapeutic Effects of Topical Application of Ozone on Acute Cutaneous Wound Healing. Journal of Korean Medical Science, 24:368-374, 200.