ALTERNATIVE TREATMENT OF BOVINE MASTITIS CAUSED BY METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS AND PROTOTHECA ZOPFII USING OZONIZED HYDROGEL: PRELIMINARY STUDY.

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RESUMO

Introduction: Intra-mammary infection is the main cause of bovine mastitis. The emergence of methicillin-resistant *Staphylococcus aureus* (MRSA) intramammary infections in dairy cattle is a global concern. *Prototheca zopfii* is an alga increasingly isolated from cows with persistent mastitis. Nowadays, MRSA and *Prototheca*-infected cows must be discarded due to the irreversible lesions in the mammary gland, economic losses and their therapeutic limitations. Ozonized vegetal oils offer germicidal action against bacteria, fungi and oomycetes. Tofu contains several anti-inflammatory and antioxidant phyto-chemicals. In view of their biocompatibility and nontoxicity, sodium alginate (SA) hydrogels have been used as drug carriers. Therefore, the goal of the present study was to investigate the sensibility of MRSA and *P. zopfii* to ozonized SA/tofu-based hydrogels. **Material and Methods:** Three increasing volumes of ozonized sunflower oil (Blustratum®, São José dos Campos, Brazil) were incorporated into the liquid form of the hydrogel (O_3-1, O_3-2 and O_3-3). Pure AS/tofu hydrogel (Non-O_3) and 50% chlorhexidine were used as controls. Four strains of MRSA and four strains of *P. zopfii* isolated from bovine mastitis were exposed to the *in vitro* treatments. The antimicrobial potential of the hydrogels was evaluated considering the antimicrobial susceptibility testing (AST), minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC). AST was based on the disk diffusion method, while 12 serial dilutions (0.05 to 100%) were used to complete the MIC and CBM assays. **Results:** The three ozonized SA/tofu hydrogels had germicidal action against the MRSA and *P. zopfii* strains. Independently of the strain, inhibition zones were visualized around the discs soaked with O_3-1, O_3-2 or O_3-3 hydrogels. For MRSA, the three ozonized hydrogels had MIC=3.13% and MBC ≤6.25%. The MIC and MBC of ozonized hydrogels were equal to 1.56 and 3.13%, respectively. Pure AS/tofu hydrogel did not show antimicrobial action (MIC and MBC>100%). **Conclusion:** AS/tofu-based hydrogels enriched with ozonized sunflower oil were effective to inactive MRA and *P. zopffi* strains isolated from bovine mastitis.

PALAVRAS-CHAVE: cattle, one health, polimer, ozone therapy, infection

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