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Mini Review

Invitation to Use Ozone Therapy in the Veterinary Medicine, Especially in Egyptian Cattle Reproduction

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The aim of this article is to highlight innovative scientific research that deserves attention about ozone treatment to overcome livestock infertility problems. Reproductive efficiency is essential for sustainable dairy and meat productions and failures in reproduction lead to economic losses. There are many challenges affecting fertility in farm animals. Oxidative stress and microbial infections during reproductive cycle of cattle are important causes of decreasing fertility and is considered an important challenge affecting reproduction. These challenges affect the animal during pregnancy, during or after parturition. The risks of physical damage during the birth process or at failure to release the placenta after parturition are often leading to increasing of microbial infections in the livestock.

In the face of declining fertility in cattle, it can be appreciation and knowledge of factors that interfere with the equilibrium regulating reproduction are the first steps of solve infertility problem. The most common method of uterine treatment is either intrauterine or systemic antibiotic administration. Major challenge facing many producers is finding practical, effective ways to improve reproductive performance. This challenge requires the creation of research ideas characterized by scientific creativity and practical application. Oxidative stress (OS), which resulted from all types of stress, occurs when the balance between reactive oxygen species (ROS) and antioxidant is disrupted. Formation of ROS (in low concentration) is a continuous and normal process of cellular metabolism but in higher concentration, it affects cell membrane integrity and functions, damage DNA, lipid and protein metabolism. Most ROS are formed because of the environmental pollutants. Antioxidants (including vitamins C and E) and antioxidant cofactors (such as selenium, zinc, and copper) can dispose, scavenging, or suppressing the formation of ROS [1].

Ozone therapy (OT) is safe and nontoxic, and therefore should be widely used in the practice of veterinary and human medicine [2]. However, in Egypt, ozone therapy is still inadequately used in veterinary practice. OT with small doses is useful and stimulating, while large doses are harmful. Ozone, a highly water-soluble inorganic molecule, is a gas made of three atoms of oxygen (O) with a cyclic structure [3]. Ozone can be produced by generator which produced through flowing air at a constant flow 51/min. with 150 electrical volte. Because of ozone`s instability and short its half-life (40 min at 20 °C), ozone cannot be stored in tanks [3]. The ozonated olive oil can be stored up to 60 days at 4° till used [4].

As a powerful oxidizer and highly reactive molecule, ozone has strong antibacterial, antiviral and antifungal action [5]. Intrauterine irrigations with ozonated distilled water (400ml) with ozone concentration of 4-5 mg/l are done to provide entire contact with the site of inflammation and to exclude any damage to the mucous membrane in different forms of endometritis. On being ozonated the water via the biluminal catheter is introduced into the uterine cavity and then evacuated via the same catheter. The procedure can be repeated 3 times during one session, which is done once a day [6]. Intrauterine infusion with ozonated olive oil can be used as 50-100ml according to the size of each uterine horn. Moreover, Vaginal irrigations with ozonated saline with the volume up to 1liter and ozone concentration of 6-10 mg/L is to be done daily (8-10 procedures per course) and are to be complemented with applications with ozonated oil (1-2 times a day).

Finally, the ozone product proved to be efficient in improvement of fertility in cattle through local treatment of the postpartum uterine mucosa this is, with the advantage of no milk and meat withdrawal period due to antibiotic residues [7]. In addition, ozone has been found to be more effective in the treatment of endometritis and retained placenta in dairy cows, compared to hormonal and/or antibiotic treatment, with no negative effect on the host regarding residues [8].

Ethics

This article is an original review article based on previously published papers and does not contain new original data.

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