Use of oromucosally administered interferon-α in the prevention and treatment of animal diseases

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Abstract

Interferon-α (IFN-α) is well known as a clinically effective antiviral and antineoplastic therapeutic agent. It has also been shown to have immunoregulatory properties. IFN-α stimulates a cell-mediated innate immune response and then participates in the transition of the initial host innate response to an effective adaptive immune response. IFN-α is produced in small quantities in nasal secretions during viral infections, prompting many authors to suggest that low-dose oromucosal administration of IFN-α effectively mimics nature. Moreover, the injectable high-dose interferon therapy currently approved for various human disorders causes numerous side effects. By contrast, oromucosal administration of IFN-α is not associated with toxic effects. Another distinct advantage is ease of administration: the IFN can be dissolved in drinking water or administered by nebulization to the oral or nasal cavity.

This review describes the current state of knowledge concerning orally administered IFN-α, of both human and animal origin, as a prophylactic or therapeutic agent in veterinary medicine. We present the effects of IFN-α in such animals as cattle, pigs, horses, cats, dogs and chickens, and attempt to explain its mechanism of action following oromucosal administration. It is hoped that this review of the medical literature on the use of IFN-α in animals will give practitioners a better understanding of the challenges and benefits of using this interesting cytokine in clinical practice.

Key words: interferon-α, oral administration, therapy, animal diseases

Cytokines, due to their immunomodulatory properties, are more and more commonly used in therapy. The branch of clinical medicine that uses these hormone-like proteins and peptides has developed dynamically in recent years, finding application in such areas as haematology, oncology, hepatology and dermatology. Cytokines are molecules that regulate such diverse processes as proliferation, differentiation or activation of cells. Because of their important role in immune processes they are often called the hormones of the immune system. Well over a hundred cytokines have already been identified, and the literature continually informs of new discoveries (Xing and Wang 2000). Cytokines can act selectively on cellular or humoral immune processes. This ability, together with their large number and such properties as pleiotropy...