



Short Communication

Nebulization with sodium chloride solution (0.9%) in the treatment of chronic canine bronchitis

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ABSTRACT

Chronic bronchitis is a disease of high occurrence in dogs. Its etiology is usually associated with allergic and / or infectious causes, in which inflammation of the bronchi and bronchioles occurs, leading to airway irritation, accumulation of mucus and clinical signs such as productive cough and exacerbated lung noise. The therapeutic protocol of humidification and mucinase through aerosolization by nebulization, may gain attention for its use in veterinary medicine in the face of the obstacles often presented due to the non cooperation of the patient and unavailability of the tutor. The present study aimed to establish the adjuvant use of nebulization in the treatment of canine bronchitis.

INTRODUCTION

Chronic bronchitis is a disease of high occurrence in dogs (ROZANSKY, 2014), affecting around 30% of patients seen in the clinical routine. It mainly affects middle-aged and elderly patients of both genders and small breeds, with a history of exposure to irritants or allergens (Mc KIERMAN, 2000).

Its etiology is usually associated with allergic and / or infectious causes, in which inflammation of the bronchi and bronchioles occurs, leading to irritation of the airways and accumulation of mucus in the interior. The chronic obstructive process is then established, preventing normal ciliary transport and increasing the release of inflammatory mediators at the site of the lesion, thereby generating a vicious cycle (HAWKINS, 2015b).

Clinical signs include chronic productive cough with evolution from months to years, intolerance to gradual

exercise, and obstructive expiratory dyspnoea. On physical examination, the animal shows a positive cough reflex in the tracheal palpation, hypersomorphous thoracic percussion, exacerbated expiratory lung noise, and wheezing with pulmonary auscultation. In animals with advanced disease, clinical signs may become more evident, leading to episodes of cyanosis and syncope. In these cases, crepitant noises appear in the pulmonary auscultation and cracks at the end of the expiration, indicating collapse of the main bronchus or intrathoracic trachea (ALONSO, 2007).

Radiographic examination suggests the presence of chronic bronchitis when the associated bronchial and interstitial patterns are visualized (ALONSO, 2007). The bronchial pattern is characterized by the appearance of radiopaque images similar to "donuts" and "train rails", which correspond to the cut Transverse and longitudinal, respectively, of the bronchi and bronchioles affected by the inflammatory process (MANTIS et al., 1998). However, the interstitial pattern is characterized

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by increased diffuse and non-structured cross-linked radiopacity in the lung fields, preventing the visualization of normal vascular and airway markers (RAO et al., 2014).

The recommended conventional treatment involves the use of bronchodilators, mucolytics and, more specifically, corticosteroids, in the allergic etiology, and antibiotics, in the infectious processes (Mc KIERMAN, 2000). The use of bronchodilators promotes the relaxation of the bronchiolar smooth muscle in front of the inflammatory constrictive frame. Xanthine derivatives, aminophylline and theophylline, as well as beta 2 agonists, such as salbutamol (ALONSO, 2007), may be used. Due to the large exudation and hypersecretion of the submucosal glands and goblet cells, also due to the inflammatory process, the use of mucolytic substances, such as acetylcysteine and bromhexine, is recommended. Mucolytic agents act by breaking the disulfide bonds in mucus composition, reducing its viscosity and facilitating expectoration (PAIVA; ALAM, 2005).

Currently, the use of aerosolization as an alternative form in the administration of some drugs has been growing in Veterinary Medicine. Nebulization with 0.9% sodium chloride solution represents one of the forms of aerosolization, where the solution used can serve as a vehicle for administration of other drugs, but alone, without the addition of other substances, it has a humidifying effect. It hydrates the airways and contributes to the dilution of the mucus produced in chronic bronchitis (ALONSO, 2007; HAWKINS, 2015a; PADRID et al., 1990).

In view of the high occurrence of chronic bronchitis in the clinical routine of gregarious animals, it is important to identify non-evolved frames for fibrosis and emphysema, and to introduce therapeutic measures that can control and, if possible, delay the evolution of the disease.

In the search for a better response to treatment and rapid recovery of the patient, as well as the satisfaction of their tutor, the present study aimed to perform a comparative study of clinical responses between conventional treatment methods and its association with saline via nebulization, for animals with chronic bronchitis, but without progression to fibrosis and pulmonary emphysema.

MATERIALS AND METHODS

A retrospective study of 20 dogs treated in the cardiology and respiratory diseases service of small animal veterinary hospital of Rural University Federal of Rio de Janeiro, males and females, aged 7 to 12 years, with clinical suspicion of chronic bronchitis was performed. At the clinical examination, all had episodes with daily frequency of dry cough with signs of sputum

at the end, at least two months, expiratory obstructive dyspnea, increased expiratory lung noise or continuous expiratory noise (wheezing) and hypersomally compatible thoracic percussion with bronchitis.

Radiographic examination of the chest was used to confirm clinical suspicion, due to the presence of bronchial and diffuse interstitial patterns in pulmonary fields. Only animals whose radiographic signs were present and distributed with all pulmonary lobes included, characterized a moderate degree. The presence of signs of increased bronchiectasis or radiolucency, which could suggest evolution for pulmonary emphysema (ALONSO, 2007), was used as exclusion criterion, since these patients already needed corticosteroid therapy (ALONSO, 2007; PAIVA; ALAM, 2005).

After the clinical and radiological evaluation, together with the history of evolution, the diagnosis of chronic bronchitis was confirmed, with an etiology to be clarified.

The animals were divided into two groups according to the protocol. Group 1 animals were treated with methylxanthine bronchodilator (aminophylline), associated with a mucolytic agent (n-acetylcysteine), both at a dose of 10 mg / kg every 12 hours, for a period of 30 days. Group 2, nebulization with 0.9% saline solution was prescribed every 12 hours for 15 days and, after this period, new clinical evaluations were performed by the same evaluator for the evolution of cough, respiratory pattern and lung noise.

In the re-evaluation, the tutor was questioned about the degree of improvement of the patient in his / her home environment considering a scale of 0 to 10, 0 where there was no improvement and 10 complete improvement with remission of clinical signs. The data were obtained in the period from 2015 to 2016, by considering only patients who returned for reassessment after therapy.

RESULTS AND DISCUSSION

Among the patients included in the 1.50% (5/10) group, there was an improvement in expiratory lung noise. The subjective evaluation of the tutors had a median value of 5. This result is common in the clinical routine, suggesting that with conventional treatment, half of the minimum treatment period established in the literature (15 of 30 days) is sufficient for clinical improvement in a population with Chronic bronchitis, but without total remission of signs and physical findings (PAIVA; ALAM, 2005).

The clinical improvement of Group 1 can be attributed to the associated use of aminophylline and acetylcysteine, where the former promoted relaxation of the

bronchiolar smooth muscle, favoring the opening of the airway, which is now constricted. Bronchodilators improve expectoration and ventilation, favoring the renewal of residual air, as well as reducing bronchospasms from the inflammatory process (HAWKINS, 2015b; PAIVA; ALAM, 2005; PIQUERAS, 2001). The second has mucolytic action, since it acts on the breakdown of a secretory structure, more specifically, on its sulfhydryl radicals (ROZANSKI, 2014). The synergism of the two substances acts to unclog the small airways, improving the ventilation of the animal and reducing the expiratory effort. It is important to emphasize that xanthine bronchodilators also act to strengthen the muscles involved in the respiratory process, thus reducing fatigue due to pathological conditions (PAIVA; ALAM, 2005).

Considering the patients submitted for nebulization, 70% showed clinical improvement at 15 days of treatment, and the tutor's perception improvement score presented a median value of 8. These data reinforce the value attributed to nebulization as an adjuvant humidifier and for mucolytic therapy in the treatment of respiratory diseases (PADRID et al., 1990; PIQUERAS, 2001).

The patient's recovery from the use of nebulization was perceptible, both in the clinical evaluation and in the evaluation of the tutors. It is justified that the particles of the 0.9% solution of sodium chloride nebulized reached the interior of the airways, promoting humidification of the ciliary epithelium, favoring the action of mucinase in association with acetylcysteine, where water was integrated into the associated mucus. The lower viscosity facilitates its mobilization and, consequently, expectoration (PAIVA; ALAM, 2005; RAO et al., 2014; ROZANSKI, 2014).

In this way, even considering observational results (PACO et al., 1990; Mc KIERMAN, 2000; RAO et al., 2014), the therapeutic protocol of humidification and mucinase through aerosolization by nebulization may gain space for its use in veterinary medicine in front of the obstacles often presented due to the patient's non-cooperation and the unavailability of the tutor.

CONCLUSION

Nebulization with 0.9% saline solution can be used to facilitate the clinical recovery process of patients with chronic bronchitis, and it may be included in the therapeutic process for its synergistic action to conventional therapy.

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