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RESEARCH ARTICLE

Therapeutic Management of Canine Respiratory Diseases of Bacterial Origin with Nebulisation and suitable Antibiotics in and around Hyderabad City, Andhra Pradesh

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Abstract

A total of 26,642 dogs with the history of systemic diseases were presented to the medical ward of University administered Veterinary Hospital, Bhoiguda, Secunderabad and Campus Veterinary Hospital, College of Veterinary Science, Rajendranagar, Hyderabad over a period of 26 months i.e., from October 2008 to November 2010. Of these 784 dogs were showing the signs of respiratory disease such as dyspnoea, cough, fever and nasal discharge etc. Among them bacterial respiratory disorders were detected in 370 dogs. From the present results the nebulisation is best method of administration of steroidal and non steroidal drugs particularly for treatment of respiratory diseases in dogs. The benefits of nebulisation of drugs with respiratory diseases is, they do not absorbed into the systemic circulation, requirement of nebulisation drug is very less, do not produce any unpleasant side effects and immediately relieves the breathing difficulties by decongesting the respiratory mucous membrane. Drugs used in three groups of dogs belonging to Ib, IIb and IIIb that had been received nebulisation in addition to the specific drugs showed faster and marked improvement of clinical signs and haematological parameters when compared to those dogs of the Groups Ia, IIa and IIIa received only specific drugs without nebulisation

INTRODUCTION

Respiratory diseases pose a major health problem in dogs and cats and other pet animals worldwide. Clinical manifestations associated with canine respiratory diseases appear suddenly Ettinger, (2006). Some of them are chronic and refractory in nature which are resistant to commonly used antibiotics, though sufficient research was conducted on respiratory diseases in abroad. Detailed research work on therapeutic management of canine respiratory diseases in India is scattered and scanty. The common clinical manifestations were dyspnoea, costal respiration/ abdominal respiration, cough, nasal discharge and congestion, edema, consolidation of lungs are some of the common signs observed in respiratory disease of dogs (Brunner et al, 1976, Clerex et al., 2003). Keeping in view the morbidity and mortality associated with respiratory diseases in dogs and cats can be effectively treated with nebulization- complementary therapy for respiratory diseases observed by (Hritcu, 2010 and Court et al.,19770 and Fichtel and knotek, 2001).

MATERIALS AND METHODS

The present investigation was carried out in the clinical cases of dogs that were presented with the history of respiratory diseases at the University administered Veterinary Hospital, Bhoiguda, Secunderabad and Campus Veterinary Hospital, College of Veterinary Science, Rajendranagar, Hyderabad over a period of 26 months i.e., from October 2008 to November 2010. Dogs presented at the above mentioned Veterinary Hospitals with the signs of respiratory tract disease formed the basis for the present investigation. Detailed history regarding frequency and consistency of respiratory tract disease was obtained from the client owners of dogs exhibiting the signs of coughing, nasal discharge, sneezing, difficulty in breathing, fever, loss of appetite and lethargic behavior. Conducted antibiotic sensitivity test of the sample for appropriate selection of antibiotic in all cases of respiratory diseases.

Group I – Mild respiratory diseases

30 dogs with mild respiratory diseases having symptoms like dry cough, serous nasal discharge, no fever, alert and active were included in this group. This group was again divided into 2 sub groups and treated with the following therapeutic regimen.

Group I a: These dogs were administered Gentamicin (Gentamicin)[1] injection @ 4.4 mg per kg body weight I/M SID for 4 days; (Tuspel Plus)[2] expectorant @ 2.5 ml/10kg body weight BID PO 4 days; Chlorpheniramine maleate (Cadistin)[3] at @ 0.5-2 ml (total dose) I/M SID for 4 days; Meloxicam (Melonex)[4] @ 0.2 - 0.3 mg per kg body weight S/C SID for 4 days.

Group I b: These dogs were administered Gentamicin (Gentamicin)[1] injection at @ 4.4mg per kg body weight I/M SID for 4 days; Salbutamol Sulphate (Asthalin)[5] nebuliser @ 2.5 mg for 5 minutes of Nebulization for four times a day for 4 days; Chlorpheniramine maleate (Cadistin)[3] @ 0.5-2 ml I/M SID for 4 days; Meloxicam (Melonex)[4] @ 0.2 - 0.3 mg per kg body weight S/C SID for 4 days.

Group II – Moderate respiratory diseases

30 dogs with moderate respiratory diseases having symptoms like moderate dry or moist cough, moderate mucus nasal discharge, mild dyspnoea, inappetence mild fever, less alert and less active were included in this group. This group was again divided into 2 sub groups and treated with the following therapeutic regimen.

Group IIa These dogs were administered Amoxicillin (Petromox)[6] injection at @ 10 mg per kg body weight I/M SID 4 days; (Kofarest)[7] expectorant @ 2.5 ml/10kg body weight BID for 4 days; Chlorpheniramine maleate (Cadistin)[3] @ 0.5-2 ml I/M SID for 4 days; Meloxicam (Melonex)[4] @ 0.2 - 0.3 mg per kg body weight S/C SID for 4 days.

Group II b: These dogs were administered Amoxicillin (Petromox) [6] injection @ 10 mg per kg body weight I/M SID for 4 days; Ambroxol Hydrochloride (Inhalex) [8] nebuliser @ ½ respule (7.5 mg) BID for 4 days; Chlorpheniramine maleate (Cadistin)[3] @ 0.5-2 ml I/M SID for 4 days; Meloxicam (Melonex) [4] @ 0.2 - 0.3 mg per kg body weight S/C SID for 4 days.

Group III severe respiratory diseases

30 dogs with severe respiratory diseases having symptoms like severe dry or moist cough, severe mucopurulant nasal discharge, severe dyspnoea, dyspepsia, high fever, dull and inactive were included in this group. This group was again divided into 2 sub groups and treated with the following therapeutic regimen.

Group IIIa These dogs were administered Cefpodoxime (Cefpet) [9] oral suspension @ 5-10 mg per kg body weight SID for 5 days; Dexomethasone (Dexona) [10] @ 0.5 -2 mg per day I/M SID for 5 days; Chlorpheniramine maleate (Cadistin) [3] @ 0.5-2 ml I/M SID for 5 days; Meloxicam (Melonex) [4] @ 0.2 - 0.3 mg per kg body weight S/C SID for 5 days; Oxygen therapy to stabilize patient.

Group III b These dogs were administered Cefpodoxime (Cefpet)[9] oral suspension @ 5-10 mg per kg body weight SID for 5 days; Budesonide (Budecort)[11] nebuliser @ 0.5 -1 mg BID for 5 days; Chlorpheniramine maleate

(Cadistin)[3] @ 0.5-2 ml I/M SID for 5 days; Meloxicam (Melonex)[4] @ 0.2 - 0.3 mg per kg body weight S/C SID for 5 days; Oxygen therapy to stabilize patient.

Nebulization

Selected group of Ib, IIb and IIIb dogs were nebulized with Salbutamol Sulphate, Ambroxol Hydrochloride and Budesonide respectively. Nebulization was done with mask that was attached to Nebulization apparatus. Nebulization procedure was given for 5 minutes.

Oxygen therapy

Oxygen therapy is advised to Groups III dogs due to the more severity of reparatory diseases, which produces hypoxemic (70-80 %) condition. Emergency use of Oxygen is essential for cell metabolism, tissue oxygenation, essential for all normal physiological functions, relieves shortness of breath and prolongs the life of respiratory patients. After completion of nebulisation oxygen therapy was indicated to hypoxemic (70-80 %) patients through oxygen mask @ 50 ml/kg of body weight/min for 3 days to improve the hypoxemic state to normal arterial oxygen tension (90-95%). The hypoxemic dogs were showed fast recovery to a comfortable state within 2 hours after indicated oxygen therapy and it was played an essential role in stabilisation of patients by maintaining normal arterial oxygen tension.

RESULTS

Depending on Antibiotic sensitivity test in mild, moderate and severe cases of respiratory bacterial diseases, sensitive antibiotics like Gentamicin, Amoxicillin and Cefpodoxime respectively were selected as a drug of choice for each group.

The therapeutic efficacy of the drugs used against various types of bacterial respiratory diseases in dogs was assessed based on clinical improvement. The various therapeutic regimens were continued for 4, 4 and 5 consecutive days for groups of dogs Ia, IIa and IIIa respectively. Group Ia dogs which received antibiotic drug, Inj. Gentamicin @ 4.4 mg per kg body weight intramuscularly once a day and Tuspel Plus expectorant @ 2.5 ml/10kg body weight two times daily orally for 4 days along with antipyretic and anti-inflammatory (Melonex) and antihistaminic (Cadistin) drugs, showed slow and sustained improvement after therapy. 12 (80%) dogs out of fifteen of this group showed moderate clinical improvement by day 4 and 3 (20%) dogs recovered beyond the therapeutic period (above 5 days). Whereas, 14 (93.33%) dogs out of fifteen dogs of group Ib were recovered in 3 days (before the therapeutic period) and 1 (6.67%) dog was recovered in 4 days (within the therapeutic period) that had received Asthalin Nebulization (@ 2.5 mg four times a day) therapy in additions to the drug received (except Tuspel Plus) by group Ia dogs, showed marked improvement in general condition, physical activity and absence of respiratory symptoms. Out of fifteen, 14 dogs reached to normal following 3 days (before the therapeutic period) and 1 dog following 4 days (within the therapeutic period) due to Nebulization effect compared to without Nebulization. (Table.1 and Fig.1).

Dogs belonging to group IIa, were treated with Inj Petromax @ 10 mg per kg body weight intramuscularly once a day and Kofarest expectorant @ 2.5 ml/10kg body weight two times a day orally for 4 days, along with antipyretic and anti-inflammatory (Melonex) and antihistaminic (Cadistin) drugs. Slow improvement in respiratory symptoms and general condition was noticed by day 4 in eleven (73%) dogs out of fifteen dogs. The remaining four (27%) dogs that were still having symptoms even after therapeutic period. Whereas, 13 (86.7%) dogs out of fifteen dogs of group IIb were recovered in 3 days (before the therapeutic period) and 2 (13.33%) dogs were recovered in 4 days (within the therapeutic period) that had received Inhalex Nebulization (at the dose rate ½ respule (7.5 mg) twice daily) therapy in additions to the drug received (except Kofarest expectorant) by group IIa dogs, showed marked improvement in general condition, physical activity and absence of respiratory symptoms. Out of fifteen dogs, 13 dogs became to normal following 3 days (before the therapeutic period) and 2 dogs following 4 days (within the therapeutic period) due to Nebulization effect when compared to dogs without Nebulization. (Table.1 and Fig.1).

Out of fifteen dogs of group IIIa that received Cefpodoxime oral suspension @ 5 mg per kg body weight, once a day, for 5 days and Inj. Dexomethasone @ 0.5-2 mg per day intramuscularly once a day for 5 days along with Oxygen therapy, antipyretic and anti-inflamatory (Melonex) and antihistaminic (Cadistin) drugs. Optimal clinical improvement was recorded in 11 (73%) out of fifteen dogs by the end of five days therapy. Whereas, the

remaining four (27%) dogs had symptoms even after the therapeutic period. Whereas, 14 (93.33%) dogs out of fifteen dogs of group IIIb were recovered in 4 days (before the therapeutic period) and 1 (6.67%) dog showed recovery in 5 days (within the therapeutic period) that treated with Budesonide nebulizer @ 0.5 mg twice daily for 4 to 5 days along with the above drugs (except dexomethasone) and Oxygen therapy showed faster recovery of signs from day 2 and complete clinical recovery with normal general condition. Out of fifteen dogs, 14 dogs reached to normal following 4 days (before the therapeutic period) and 1 dog following 5 days (within the therapeutic period) due to nebulization effect when compared to dogs without nebulization (Table.1, Fig 1 and Fig.2).

The nebulisation is best method of administration of steroidal and non steroidal drugs particularly for treatment of respiratory diseases in dogs. The benefits of nebulisation of drugs with respiratory diseases is, they do not absorbed into the systemic circulation, requirement of nebulisation drug is very less, do not produce any unpleasant side effects and immediately relieves the breathing difficulties by decongesting the respiratory mucous membrane.

Hence, for the treatment of respiratory infection it may be concluded from the present results, the dogs belonging to Groups Ib, IIb and IIIb that had received nebulisation in addition to the specific drugs showed faster and marked improvement in clinical parameters before the therapeutic period when compared to those dogs of the Groups Ia, IIa and IIIa received only specific drugs

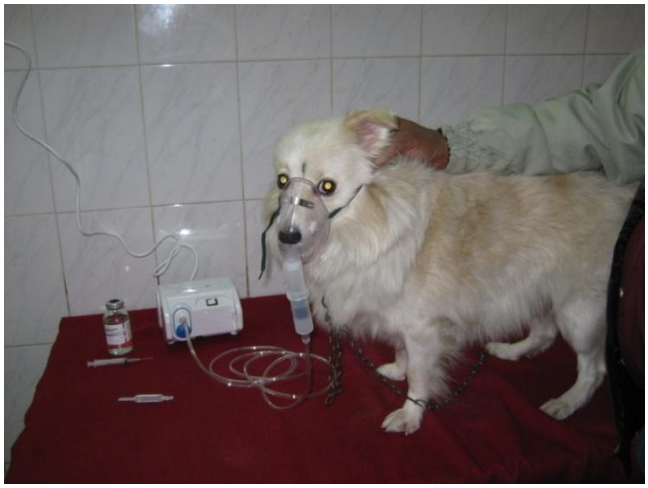

Fig 1. Nebulization of Pomeranian dog with nebulizer

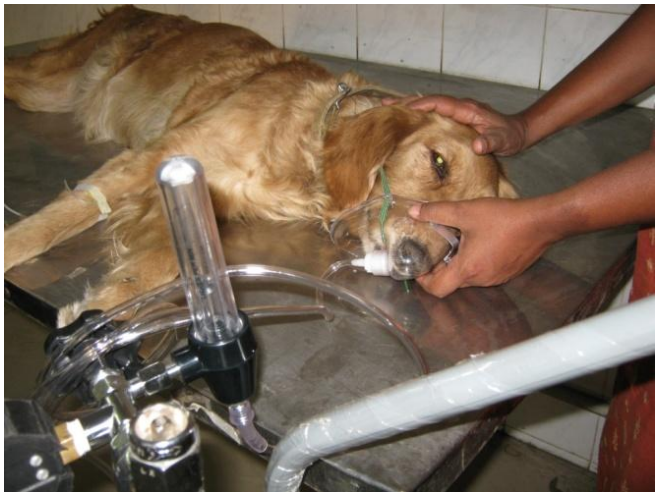

Fig 2. Severe respiratory disease in Golden retriever dogs- Oxygen therapy

Group	Without nebulisation (Group a)						With nebulisation (Group b)					
	Therapeutic Regimen	No. of dogs					Therapeutic Regimen	No. of dogs				
		Treated	Therapeutic response					Treated	Therapeutic response			
			4 th day	%	Beyond 5 days	%			3 rd day	%	4 th day	%)
(I)	1. Inj. Gentamycin 2.Tuspel Plus Expectorant 3. Inj. Melonex 4..Inj. Cadistin	15	12	80	3	20	1. Inj Gentamycin 2.Asthalin nebulisation 3. Inj. Melonex 4..Inj. Cadistin	15	14	93.33	1	6.67
(II)	1.Inj. Petromax 2.Kofarest Expectorant 3 Inj. Melonex 4.Inj. Cadistin	15	11	73	4	27	1.Inj. Petromax 2. Inhalex nebulisation 3. Inj. Melonex 4.Inj. Cadistin	15	13	86.7	2	13.33
III)	1. Cefpet Oral susp 2. Inj. Dexona 3. Inj. Melonex 4.Inj. Cadistin	15	11	73	4	27	1. Cefpet Oral 2. Budecort nebulisation 3. Inj. Melonex 4.Inj. Cadistin	15	14	93.33	1	6.67

Table 1: Relative efficacy of various therapeutic regimens for different types of respiratory diseases in dogs

DISCUSION

Of these 784 dogs were showing the signs of respiratory disease such as dyspnoea, cough, fever and nasal discharge etc. Among them bacterial respiratory diseases were detected in 370 dogs. Incidence of 20 clinical cases of chronic nasal diseases in dogs seen between October 1985 and May 1986 (Skae, 1988). Whereas Tekdek and Ezeokoli,(1982) was reported that outbreak occurred between October and December 1980, 21 per cent of dogs were diagnosed clinically as suffering from kennel cough, compared with 0.2 per cent in preceding year. Earlier examination results of Mochizuki et al., (2008) reveals that 68 household dogs were showing clinical signs of respiratory infection and 20 dogs (29.4%) were found to be positive for bacterial agents.

Similar therapeutic trials were conducted by Amrute et al (2009) having bronchopneumonia in dog with Inj. Intacef–Tazo (Cetriaxone+Tazobactum) as a antibiotic, Inj. dextrose as an energy source, Inj. Meloxicum as anti-inflammatory, Inj. Deriphylline as a bronchodilator, Nebulisation with Asthalin along with expectorant cough syrup for 9 days. After 9 days of treatment, the dog showed marked improvement in health. Earlier reports of Pozza and Vismara, (1976) shows that gentamicin was found to be effective against gram-negative and gram-positive bacteria and a cure was obtained in 92% of cases treated by intramuscular injection and in 90% of the cases treated topically. Similar findings were reported by Gingerich et al., (1983) while conducting trial, 117 dogs were treated for tracheobronchitis (72), bronchitis (22), laryngitis (14), pharyngitis (8) or tonsillitis (1) with a single injection of butorphanol (0.025 mg/lb s/c) followed by tablets (0.25 mg/lb) twice daily for at least 48 hours. The number of coughs was reduced from 21 per hour before treatment to 4 in one hour after injection. The antitussive effect persisted for 7-12 hours after oral treatment. Average duration of treatment was 4 days and the clinical efficacy was excellent or good in 105 (91%) of dogs. Whereas Roudebush and Fales, (1981) recommended that Chloramphenicol, gentamicin, kanamycin, tetracyclines, carbenicillin or erythromycin for confirmed or suspected infections with B. bronchiseptica and of them 9 strains were tested, 8 were resistant to trimethoprim/sulfa which were in correlelation with the present findings. Similar findings were reported by Scarpa et al., (1992) observed chronic cough and dyspnoea in 20 dogs (3-13 years of age) and 8 (group I) were treated with methylprednisolne acetate at 0.5 mg/kg twice daily for 5 days, then once a day for 5 days, 6 (group II) were treated with theophylline at 8 mg/kg every 8 h

for 10 days, and 6 (group III) were given oral doses of oxatomide, a dual-action antihistaminic (H_1 receptor antagonist and inhibitor of the liberation of anaphylaxis mediators), at 2.5 mg/kg twice a day for 10 days. At the end of treatment the cough and dyspnoea had disappeared completely or partially in 6, 4 and 6 of groups I, II and III, respectively. Angus et al., (1997) suggested amikacin, ceftizoxime, enrofloxacin and gentamicin choices for treatment of infectious lower respiratory tract disease of dogs. These findings were corroborating with the observations of above authors.

Regarding nebulisation trials, similar trials of Anusz, (2005), Padrid, (2006), Bexfield et al., (2006) and Windsor and Johnson, (2006) shows that infectious causes should be treated by using antibiotics and inhaled corticosteroids. And also stated that inhaled corticosteroid drugs were not as absorbed into the systemic circulation, did not result in significant side effects and were now the standard of care for dogs and cats with respiratory diseases that would otherwise be treated with systemic medications. Paunescu et al., (2007) used dexamethasone along with antibiotics for treatment of respiratory diseases in dogs. Hirt et al., (2008) also reported that treatment of chronic non-infectious inflammatory respiratory diseases with inhaled glucocorticoids appears to be an effective alternative, thereby avoiding the unpleasant side effects of systemic glucocorticoid therapy. Hritcu, (2010), Scapra et al., (1992) and Votion et al., (1997) stated that Nebulisers were primarily used to decongest respiratory mucous membranes in cases of respiratory diseases. They were often used to administer steroids, antibiotics and other medications. Baker, (2004) and Bruun Eriksen, (2008) reported that there was a fast recovery to a comfortable state within 2 hours after Oxygen therapy for hypoxic patients and plays an essential role in stabilisation of patients.

Similar findings regarding oxygen therapy were noticed by Baker (2004) after oxygen therapy, there was a reversal of cyanosis and fast recovery to a comfortable state within 2 h. Clark et al., (1997) reported that in severe respiratory disease, measurement of arterial oxygen tension gives a useful assessment of respiratory failure in dogs.

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