



Clinical, Bacteriological and Therapeutic Studies on Chronic Rhinosinusitis in Persian cats

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Abstract

Chronic snuffles was a common problem in cats. A total number of 15 Persian cats (3 apparently healthy and 12 clinically diseased cases with chronic snuffling) of 2.7 to 4.2 years admitted to faculty of veterinary medicine, Cairo university hospital and private veterinary clinics. The apparently healthy group was showed no respiratory manifestations and normal breath sounds on auscultation. Mucous membranes were faint rosy red. Superficial lymph nodes were free. Bacteriological examination was negative. Chronic snuffles cats (12 cases) were divided into 2 subgroups according to clinical presentation and systemic reactions. The first subgroup was chronic snuffler cats without systemic reaction (3 cases) which showed chronic snuffling, nasal discharges, ocular discharges since 3 months. Tracheal auscultation was revealed crackles. No significant change in respiratory rate, pulse rate or rectal temperature in comparison apparently healthy group. Mucous membranes were faint rosy red. Superficial lymph nodes were enlarged. No abnormal lung sounds were recorded. Bacteriological examination was revealed *Pasteurella multocida* in the 3 chronic snuffles cats. The first was susceptible to clindamycin, the second was susceptible to ciprofloxacin, the third was susceptible to neomycin and all 3 cats showed multidrug resistance. The second subgroup was Chronic snuffles cats with systemic reaction (9 cases). This group was showed open mouth breath (dyspnea), chronic snuffling, nasal discharges, ocular discharges since 3 weeks. Respiratory rate, pulse rate and rectal temperature were displayed significant increase in comparison to apparently healthy group. Bacteriological examination revealed 9 *Staph. aureus*. All group was susceptible to amoxicillin-clavulanic acid in vitro and showed multidrug resistance. In vivo treatment of chronic snuffles subgroups were responded to antibiotics of the present in-vitro study except one case in subgroup 1 and one case in subgroup 2.

(Keywords: clinical, bacteriological, therapeutic, snuffles, rhinosinusitis and dogs)

Introduction

Nasal disease is a common presenting problem in feline medicine. The management of feline nasal disease could be challenging at a certain levels. In major cases, a specific diagnosis may remain elusive. Chronic (long-term) upper respiratory tract (URT) disease (also known as chronic nasal discharge) is a relatively common problem in cats, and can have many causes. The syndrome refers to chronic disease affecting the nose (nasal cavities) or the nasopharynx (the air passage immediately behind the nose). One of the most common forms is termed chronic post-viral rhinitis (inflammation or infection in the nose). In this condition, viral infection (e.g., acute upper respiratory infection caused by feline herpesvirus – FHV or feline calicivirus – FCV) causes damage to the delicate mucosal lining inside the nose, and even to the fine turbinate bones within the nose; but the chronic signs related to secondary bacterial infection that occurs as a result of the damaged nasal passages. This can lead to chronic persistent signs with sneezing, nasal discharge and nasal congestion. Some conditions may not be easily curable so owners need to understand the need for long-

term management. In addition, treatment may be compromised by poor patient compliance according to Leperlier et al. (2010), Vascellari et al. (2011) and; Reed and Gunn-Moore (2012). Clinical signs of upper respiratory disease are common in cats. The differential diagnosis includes viral, bacterial, and fungal infections; chronic rhinosinusitis; foreign bodies; tooth root disease; neoplasia; inflammatory polyps; nasopharyngeal stenosis; and trauma according to Quimby J, and Lappin M. (2009); and Quimby J, and Lappin M. (2010).

The objective of the present study was to identify the specific causes of chronic snuffles (chronic rhinosinusitis or CRS) and the most suitable medicinal treatment and multidrug resistance according to antibiotic susceptibility testing.

Materials and methods

A total number of 15 Persian cats (3 apparently healthy and 12 clinically diseased cases with chronic snuffling) of 2.7 to 4.2 years admitted to faculty of veterinary medicine, Cairo university hospital and private veterinary clinics.

A) Diagnostic studies

All cats of the present study exposed to thorough clinical examination; including respiratory rate /min., pulse rate /min., rectal temperature ° C, visible mucous membranes evaluation, lymph nodes and clinical signs according to Kelly (1974).

Bacteriological examination was done on 12 bacterial swabs from nose of chronic snuffles cats inoculated to nutrient broth then cultivated to selective media of Staph. aureus (Mannitol salt agar) according to Bachoon (2008) and Anderson and Cindy (2013); and Pasteurella multocida (Mueller-blood agar) according to Avril, et al. (1990). Antibiotic susceptibility testing was done according to Jorgensen and Turnidge (2007)

B) Treatment regimen according to Antibiotic susceptibility testing was done according to Jorgensen and Turnidge (2007). The used antibiotics was amoxicillin-clavulanic acid (synloux, subcutaneous injection every 24 hours at dose rate of 0.3/ 5kg of cat, Pfizer), clindamycin (clindam 150mg, capsule /12 hours, Sigma), ciprofloxacin (ciprobay 250mg, capsule /12 hours, Bayer), neomycin sulfate (neomycin 500mg, tablet /12 hours, CID) for 2-3 weeks according to clinical response.

C) Statistical analysis:

It was conducted using SPSS version 20, independent T-test according to method described by Nie et al. (1975).

Results

Recorded clinical signs were ongoing sneezing, inspiratory dyspnea through the nose, nasal discharge, nasal inflammation, redness around the eyes and under the eyelids plus ocular discharge

A) Diagnostic studies

The present study was classified into 2 major groups:

1) Apparently healthy group

This group was showed no respiratory manifestations and normal breath sounds on auscultation. Mucous membranes were faint rosy red. Superficial lymph nodes were free. Bacteriological examination was negative on cultivation.

2) Chronic snuffles cats group

This group (12 cats) was divided into 2 subgroups according to clinical presentation and systemic reactions

a) Chronic snuffer cats without systemic reaction (3 cases)

This group was showed chronic snuffling, nasal discharges, ocular discharges since 3 months. Tracheal auscultation was revealed crackles. No significant change in respiratory rate, pulse rate or rectal temperature in comparison to apparently healthy group (table 1). Mucous membranes were faint rosy red. Superficial lymph nodes were enlarged. No abnormal lung sounds were recorded. Bacteriological examination revealed Pasteurella multocida in 3 chronic snuffles cats. The first was susceptible to clindamycin, the second was susceptible to ciprofloxacin, the third was susceptible to neomycin and all 3 cats showed multidrug resistance.

b) Chronic snuffles cat with systemic reaction (9 cases)

This group was showed open mouth breath, chronic snuffling, nasal discharges, ocular discharges since 3 weeks. Respiratory rate, pulse rate and rectal temperature were displayed significant increase in comparison to apparently healthy group (Table 2). Bacteriological examination revealed 9 Staph. aureus. All group was susceptible to amoxicillin-clavulanic acid in vitro and showed multidrug resistance.

B) Treatment regimen

In vivo treatment of chronic snuffles subgroups were responded to antibiotics of the present in-vitro study as follow:

a) The first subgroup:

The first cat was responded within 2 weeks, the second cat was responded within 3 weeks and the third cat still snuffling and not respond to neomycin after 3 weeks treatment (oral treatment).

b) The second subgroup:

All nine cases responded in vivo S/C injection to amoxicillin clavulanic acid except one case not respond to treatment was recorded.

Table (1):

Parameters	Apparently healthy group (3 cases)	Chronic snufflers without systemic reaction (3 cases)
Respiratory rate /min.	30.33 ± 0.88	32.67 ± 0.88
Pulse rate/ min.	125.00 ± 3.21	132.33 ± 1.86
Rectal temperature ° C	38.53 ± 0.12	38.40 ± 0.21

Table (2):

Parameters	Apparently healthy group (3 cases)	Chronic snufflers with systemic reaction (9 cases)
Respiratory rate /min.	30.33 ± 0.88	43.89 ± 0.86*
Pulse rate/ min.	125.00 ± 3.21	150.67 ± 1.72*
Rectal temperature ° C	38.53 ± 0.12	40.81 ± 0.24*

Discussion

Chronic rhinitis is a common and important problem in cats potentially resulting from a number of intranasal or systemic disorders. Idiopathic chronic rhinosinusitis and nasal neoplasia are the most common causes of chronic nasal disease in cats (Kuehn, 2006). Clinical signs of upper respiratory disease are common in cats. Common diagnostic differentials include viral, bacterial, and fungal infections; chronic rhinosinusitis; foreign bodies; tooth root disease; neoplasia; inflammatory polyps; nasopharyngeal stenosis; and trauma. A complete diagnostic workup is important to determine the etiology so that the treatment regimen can be appropriately directed and maximal response to therapy obtained.

The present study was classified into 2 main groups. The first was apparently healthy group, was showed no respiratory manifestations and normal breath sounds on auscultation. Mucous membranes were faint rosy red. Superficial lymph nodes were free. Bacteriological examination was negative on cultivation. The second group was chronic snufflers cats group which was divided into 2 subgroups according to clinical presentation and systemic reactions. The first subgroup was chronic snufflers cats without systemic reaction which was showed chronic snuffling, nasal discharges, ocular discharges since 3 months. Tracheal auscultation was revealed crackles. No significant change in respiratory rate, pulse rate or rectal temperature in comparison apparently healthy group. Mucous membranes were faint rosy red. Superficial lymph nodes were enlarged. No abnormal lung sounds were recorded. Bacteriological isolation was revealed *Pasteurella multocida* in the 3 chronic snufflers cats. The first was susceptible to clindamycin, the second was susceptible to ciprofloxacin, the third was susceptible to

neomycin and all 3 cats showed multidrug resistance. The second subgroup was chronic snufflers cats with systemic reaction. This group was showed open mouth breath, chronic snuffling, nasal discharges, ocular discharges since 3 weeks. Respiratory rate, pulse rate and rectal temperature were displayed significant increase in comparison to apparently healthy group. Bacteriological isolation revealed 9 *Staph. aureus*. All group was susceptible to amoxicillin-clavulanic acid in vitro and showed multidrug resistance while Johnson et al. (2005) recorded that aerobic bacteria were detected in flush samples from 5 of 7 control cats; culture of flush samples from chronic rhinosinusitis CRS-affected cats yielded aerobic bacteria (9/10 cats), anaerobic bacteria (3/10), and *Mycoplasma spp* (2/10). No fungal organisms were isolated from any cat. Potential micro-organisms were isolated significantly more often from CRS-affected cats than from apparently healthy cats. Bacterial examination of biopsy specimens yielded aerobic bacteria (2/7 apparently healthy cats and 4/10 CRS-affected cats) and anaerobic bacteria (2/10 CRS-affected cats). Although feline herpes virus FHV-1 did not detected in nasal biopsy specimens from apparently healthy or CRS-affected cats, FHV-1 DNA was detected via PCR assay in specimens from 4 of 7 apparently healthy cats and 3 of 10 CRS-affected cats.

In vivo treatment of chronic snufflers subgroups were responded to antibiotics of the present in-vitro study except one case in subgroup 1 and one case in subgroup 2.

In comparison to another study recorded by Galler (2012) by diagnoses of 41 cats with chronic nasal disease included nasal neoplasia (n = 19), idiopathic chronic rhinosinusitis (ICRS) (n = 12), nasopharyngeal polyps (n = 3), foreign bodies (n = 2), nasopharyngeal stenosis (n = 1) and nasal aspergillosis (n = 1). In 3 cats diagnosis

could not be established despite thorough work-up. Gender, indoor or outdoor housing, quality or quantity of nasal discharge, bacteriological findings of nasal flushes, radiology and CT findings did not differ significantly between cats with neoplasia and cats with ICRS. Cats with neoplasia were older (3 - 15, median 11 years) and showed clinical signs for a shorter period of time (1 - 8, median 2 months) than cats with ICRS (age 1 - 13, median 7.5 years; signs: 1

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- Conclusion**
Compared with findings in control cats, Staphylococcal and pasteurella multocida were detected more commonly in samples from cats with chronic snuffling. Treatment regimen differ in both groups as recorded by antibiotic sensitivity testing.
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المخلص العربي

دراسات اكلينكية وبكتريولوجية وعلاجية على التهاب الانف والجيوب الأنفية في القطط الشيرازي تعتبر ظاهرة العطس المزمن من الاعراض الشائعة لالتهاب الانف المزمن وقد تمت الدراسة الحالية على عدد 15 حالة وقسمت الدراسة الحالية الى مجموعتين: المجموعة الاولى 3 حالات من القطط كمجموعة ضابطة من القطط الشيرازي والمجموعة الثانية 12 حالة مرضية مصابة بالعطس المزمن ولقد أجريت الدراسة في مستشفى كلية الطب البيطري (جامعة القاهرة) وبعض العيادات الخاصة وكانت القطط في سن من (2.7-4.2) سنة وكانت المجموعة الاولى الضابطة القطط بها لا تعاني من اعراض تنفسية ولا يوجد اصوات تنفسية غير طبيعية عند التسمع وكانت ايضا سالبة الفحوصات البكتريولوجية بينما قسمت المجموعة الثانية الى مجموعتين فرعيتين طبقا للاعراض السريرية والتفاعلات الجسمية فاما المجموعة الاولى الفرعية فكانت بدون تفاعلات جسمية كما اظهرت عطس مزمن وافرازات من العين منذ 3 شهور واظهر التسمع صوت كركرة ولم يظهر اي تغيير معنوي عن المجموعة الضابطة في معدل التنفس والنبض ودرجة الحرارة وكانت الغدد الليمفاوية متورمة والاعشبية المخاطية طبيعية باللون الاحمر الوردي الباهت ولم يوجد اصوات تنفسية بالرنة واظهر الفحص البكتريولوجي الباستريلا ملتوسيدا وكانت العينة الاولى حساسة للمضاد الحيوي كلينداميسين والعينة الثانية حساسة للمضاد الحيوي السبروفلووكساسين والعينة الثالثة حساسة للنيومايسين واظهرت الثلاث عينات مقاومة للمضادات الحيوية الاخرى بينما كتبت المجموعة الثانية الفرعية بالتفاعلات الجسمية وكانت الاعراض السريرية عبارة عن تنفس فيمي و عطس مزمن وافرازات انفية ومن العين منذ 3 اسابيع ولقد اظهرت الدراسة تغييرا معنويا في معدل التنفس والنبض ودرجة الحرارة وكانت الغدد الليمفاوية متورمة والاعشبية المخاطية محتقنة وكانت الاستجابة للمضادات الحيوية في المجموعتين متميزة ما عدا في المجموعة الاولى الفرعية لعينة رقم 3 كانت مقاومة للمضادات الحيوية بعد العلاج وفي المجموعة الثانية الفرعية مقاومة لعينة واحدة.