

CLINICAL CASES OF *AELUROSTRONGYLUS ABSTRUSUS* AND FELINE IMMUNODEFICIENCY VIRUS CO-INFECTION IN CATS

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ABSTRACT

Cases of co-infections due to the lungworm *Aelurostrongylus abstrusus* and feline immunodeficiency virus (FIV) in three cats are described. During 2017, 44 cats infected with FIV and 11 with *A. abstrusus* were presented to the Small Animal Clinic, Trakia University. And three of them were lethargic, anorexic and with pale mucous membranes, dyspnea, coughing and nasal discharge. No changes were observed in blood count. Parasitological and serological examinations were carried out. The larvae from the stool were identified as belonging to *A. abstrusus* and antibodies against FIV were detected as well. Radiographic findings included a generalized bronchointerstitialalveolar pattern and bronchial wall thickening. A proper medication with endectocide, antibiotics and fluids was prescribed. The effect of treatment was satisfactory and improvement of the general condition was observed.

Key words: Feline immunodeficiency virus (FIV), *Aelurostrongylus abstrusus*, lungworm, cats.

Introduction

A diverse range of species of the Family Metastrongyloidea are known to infect the lungs of domestic and wild Felidae. In domestic cats (*Felis silvestris catus*), *Aelurostrongylus abstrusus* and *Troglostrongylus subcrenatus* are reported to infect the respiratory parenchyma and *Oslerus rostratus* is known to infect the bronchial submucosa (Bowman, 2000). The clinical and epidemiological relevance of these nematodes in feline populations has been largely underestimated. Previous studies on lungworms are mostly limited to case reports on clinically affected cats and to a few epidemiological surveys (Traversa et al., 2010).

Within Europe, infections with *A. abstrusus* are well documented in domestic cats (Grandi et al., 2005; Taubert et al., 2009). Reported prevalence in southern Mediterranean countries varies from 1% in Spain (Miro et al., 2004) to 17.4% in cats in north-west Portugal (Payo-Puente et al., 2008). Indeed, knowledge of the fundamental biology and epidemiology of this parasite genus is limited, most likely due to the morphological similarity between larvae (L₁) of *Troglostrongylus brevior* and those of the better-known *A. abstrusus* (Otranto et al., 2013; Traversa and Di Cesare, 2013).

Even though *A. abstrusus* is considered by many practitioners sporadic and relatively non-pathogenic, the last few years have witnessed increasing awareness of its impact on feline health (Traversa and Di Cesare, 2013; Traversa et al., 2008; Mircean et al., 2010; Barutzki and Schaper, 2013). Depending on the life style (indoors, outdoors), geographic origin and methods used for diagnosis, recorded prevalence in cats varies widely from 1.2 % in owned cats (Riggio et al., 2013) to 50 % in free roaming cats (Knaus et al., 2011).

Feline immunodeficiency virus (FIV) is a lentivirus in the family *Retroviridae* that causes immune dysfunctions in cats similar to those observed in people infected with human

immunodeficiency virus (HIV) (Gabor et al., 2001; Ishida et al., 1989; Pedersen et al., 1989; Pedersen, 1994; Zenger, 1990). FIV was first described in 1987 in a large multiple cat household experiencing immunodeficiency related diseases (Pedersen et al., 1987). Feline immunodeficiency virus (FIV) is an important pathogen of domestic cats that is distributed worldwide. Prevalence estimates vary from 1% to 44%, depending on the geographical location as well as the entry criteria of each study (Hartmann, 1998; Ishida et al., 1989). Clinical symptoms during the initial few weeks of infection include fever, leucopenia, gingivitis, and generalized lymphadenopathy. Clinical signs usually regress by 1 – 4 months post experimental infection, concurrent with seroconversion, and a latent stage of variable duration occurs wherein viral load attains a steady state. End stage disease typically does not occur for several years post-infection, and is marked by loss of CD4 immunocytes and high circulating viral load. Clinical signs reported during this phase of disease include neurologic manifestations, enhanced susceptibility to opportunistic infections, and neoplasia (Ravi et al., 2010).

To the best of our knowledge only one lethal case of co-infection with *A. abstrusus*, feline leukaemia virus (FeLV) and feline immunodeficiency virus (FIV) is reported by Philbey et al., 2014. The authors suggest that immunosuppression may have contributed to the hyperinfection syndrome with *A. abstrusus* in this case. However, our study is about a co-infection between *A. abstrusus* and FIV only.

Materials and methods

During 2017, 11 cats, presented at Small Animal Clinic to Trakia University, Stara Zagora with lethargy, anorexia, pale mucous membranes, dyspnea, coughing and nasal discharge. That was subjected to physical, parasitological, serological and radiological examination. All the cats were male, non-neutered, 5 to 7 years old, living in the villages and with outdoor access.

Stool samples obtained from these animals were examined by Baermann's technique according to Sirois, 2017 (Fig. 1).

For detection of feline immunodeficiency virus antibodies and feline leukemia virus antigens (p27) - blood samples were examined using enzyme immunoassay tests SNAP® FIV Ab/FeLV Ag Combo Plus Test Kit (IDEXX Laboratories, Inc. Westbrook, Maine, USA) (Fig. 2). Hematological parameters WBC, Hb, RBC, PCV, MCV and PLT were tested by automatic hematological analyzer EOS-VET (EXIGO, Sweden).



Figure 1: Baermann's technique



Figure 2: SNAP® Combo Plus Test

Results

During the year, 11 cats with respiratory disorders, were found to be positive for *A.abstrusus* first stage larvae (Fig. 3 & 4). The intensity of infection was from 53 to 985 LPG (larvae per gram feces). All the cats were afebrile with generalized and mild lymphadenomegaly. Physical examination demonstrated the presence of mild wet rales along the entire lung auscultation field. In three of the cases was detected co-infection with FIV. No abnormalities were observed in blood count. Radiographic findings included a generalized bronchointerstitioalveolar pattern and bronchial wall thickening (Fig. 5).

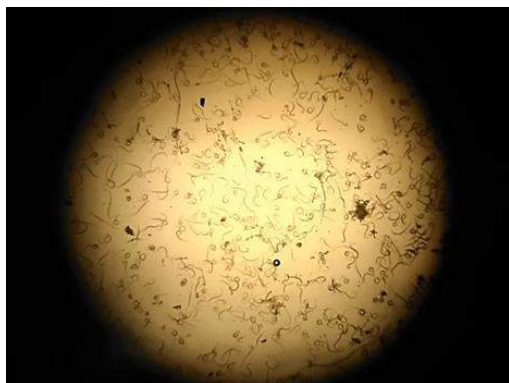


Figure 3: Larvae found in stool



Figure 4: L₁ of *A. abstrusus*



Figure 5: Generalized bronchointerstitioalveolar pattern in a cat with FIV and *A. abstrusus*

Discussion

A proper medication with antibiotics, endectocide and corticosteroids was prescribed. All the animals were given the following treatment:

Amoxicillin and clavulanic acid (Synulox™, Zoetis) – at a dose of 1mg/10kg for 15 days, s.c.
Dexamethasone 0,2 % (Alfasan) – 0.2mg/kg, i.m., 7 q 48 h

Praziquantel and abamectin (Prazimec C, Biovet®) – orally 1 tablet per 2.5 kg b.w., 2–5 q 15 days, until become negative for *A. abstrusus* larvae.

The effect of treatment was satisfactory in all cats and improvement in their general condition was observed.

There were no differences in the severity of the clinical manifestation, blood parameters, larval count and radiological findings in cats with single *A. abstrusus* infection compared to those with *A. abstrusus* and FIV co-infection. Our results are not supporting the suggestion of Philbey et al., 2014 who described lethal cases in kittens with *A. abstrusus*, FIV and FeLV co-infection. The cases of single and co-infections described in our paper are only in adult cats. Probably the age of the animals is crucial for the severity of infections and outcome of the diseases, so further investigations are needed. Taking into account that lungworms, FIV and FeLV infections are very common worldwide, regular testing of every cat with respiratory symptoms for these pathogens is necessary for proper therapy.

Conclusion

In conclusion, our investigation shows that FIV do not influence on the progress of *A. abstrusus* infection in the adult cats.

And, periodic coprological examinations of animals that are in contact with the external environment are recommended.

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