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FELINE IMMUNODEFICIENCY VIRUS INFECTION IN CATS FROM SÃO PAULO, BRAZIL

INFECÇÃO PELO VÍRUS DA IMUNODEFICIÊNCIA ADQUIRIDA DOS FELINOS EM GATOS DA CIDADE DE SÃO PAULO, BRASIL

Mitika Kuribayashi HAGIWARA[1]; Archivaldo RECHE JUNIOR[2]; Silvia Regina Ricci LUCAS[2]; Maria Lucia Zaidan DAGLI[3]

SUMMARY

Clinical and epidemiological aspects of three cases of Acquired Immunodeficiency Syndrome in cats related to FIV infection are described. Two of the patients were siamese, male and female, three years old cats and the third one was a male, six years old, short haired domestic cat. Fever, icterus, spleen enlargement, ematiation and weakness were the clinical signs observed. The main hematological alterations were anemia, apparently not related to hemobartonellosis, found in two of the cats, neutrophilia in all of them and lymphopenia observed in one. The necropsy made on two cats revealed that sepsis was the major cause of the worsening of clinical conditions of the FIV infected cats. **Moraxella phenilpiruvica** was isolated from kidney of one patient. All of the cats were FIV positive and FeLV negative and had been sick for a long time with clinical signs related to feline AIDS.

UNITERMS: Feline Acquired Immunodeficiency Syndrome; São Paulo; Brazil

INTRODUCTION

Increased susceptibility to common infections of cats had been attributed for a long time to the infection of feline leukemia virus (BARLOUGH[1], 1983). In fact, FeLV infection resulted not only in lympho or myeloproliferative diseases but in the majority of the cases, it was related to an increased susceptibility of cats to other infections such as feline infectious peritonitis, hemobartonellosis, feline rhinotracheitis, fever of unknown origin, anemia or fatal enteric infections (HARDY JUNIOR[4,5], 1980, 1987). In many cases, however the FeLV infection could not be demonstrated by isolation or immunofluorescence methods, though.

In 1987, PEDERSEN et al.[8] succesfully isolated from a cattery in which several animals had presented lymph node enlargement, fever, leukopenia, periodontitis and pustular dermatitis, a lymphotropic virus that lead to immunosuppresion. The new isolate was named feline T lymphotropic virus and soon was recognized as a member of Retroviridae family, subfamily Lentivirinae and nowadays is known as feline immunodeficiency virus.

The isolation and characterization of the FIV allowed to make a large epidemiological study about its dissemination in the USA (YAMAMOTO et al.[13], 1988), Japan (ISHIDA et al.[6,7], 1988, 1989) and Canada (YAMAMOTO et al.[12], 1989). The worldwide distribution of the virus was demonstrated. Through the immunofluorescence method for detection of specific antibodies, it was known that both, sick and healthy cats could be found infected by FIV. However, according to ISHIDA et al.[7] (1989), the proportion of FIV positive animals is three times higher among diseased cats than in the healthy group. Stomatitis and gengivitis (52.4%), chronic respiratory diseases (28.9%), anemia (17.9%), bacterial infections (14.4%), chronic enteritis (11.9%) and ematiation (17.9%) were the most common diseases associated to FIV infection. Lymphoadenopathy and leukopenia, as well as renal disease and fever of unknown origin were found less frequently. Small numbers of animals had presented opportunistic infections such as hemobartonellosis, toxoplasmosis, notoedric mange, cryptococcosis, candidiasis and atypical **Mycobacterium infections**. Association with FeLV infection was found in about 12% of the cases.

Although almost all of the FIV infected cats were symptomatic at the time the diagnosis was made, it seemed that a small number of them remained healthy after infection (YAMAMOTO et al.[13], 1988; SHELTON et al.[11], 1990).

1 - Professor - Faculty of Veterinary Medicine and Zootechny - University of São Paulo, Brazil
2 - DVM - Faculty of Veterinary Medicine and Zootechny - University of São Paulo, Brazil
3 - DVM - Faculty of Veterinary Medicine and Zootechny - University of São Paulo, Brazil

Actually, cats experimentally infected by FIV remained healthy without any signs of disease. According to SHELTON et al. [11] (1990), FIV infection of cats, as occured in human lentivirus infection, is characterized by a long period of latency and the symptoms were related to the involvement of the immune system and subsequent invasion of the body by infectious agents.

Little is known about FIV infection in Brazil. There is only one report of a FIV positive case (PEREIRA; PERES [10], 1990). In order to fill that gap, we are studying the prevalence of FIV infection in cats since 1990. Three cases of FeLV negative and FIV positive cats have been found since then and they are described here.

MATERIAL AND METHOD

CASE Nº 1

In January 12th, 1990, a male six year old shorthaired domestic cat was referred by a practitioner from Rio de Janeiro, because of icterus and fever lasting for five months. Five days prior to visit, an intractable diarrhea besides an evident weight loss was observed. Icterus and emaciation were the promminent feature that could be found on physical exam. The hematological examination revealed only increased leukocyte count and neutrophilia without any alteration on the erythrocyte or thrombocyte counting. The FeLV test resulted negative while FIV test was positive. Because of the extremely poor condition of the cat, the owner decided not to do any other exam or treatment. The outcome was unknown.

CASE Nº 2

A siamese male three year old cat was examined at the Veterinary Teaching Hospital, Faculty of Veterinary Medicine, University of São Paulo, because of loss of appetite, prostration and ataxia. On physical examination icterus, dehydration and kidney enlargement were observed. Blood was collected for hematological procedures and for FeLV/FIV infection tests. The animal died soon after the exam. At necropsy, spleen and liver enlargement, icterus and a large number of small abcesses in the liver and kidney parenchyma besides purulent nephritis were found. Pleural and abdominal effusion were also observed. **Moraxella phenilpiruvica** was succesfully isolated from kidney. FeLV test was negative while FIV test was positive.

CASE Nº 3

A three year old female siamese cat was examined in 1990, August 28th because of anorexia and emaciation of seven days of duration. One week before, she had delivered four kittens that did not survive. On physical examination, anemia, purulent vaginal discharge, enlarged spleen and dehydration were found. Blood was collected for hematological exam and FeLV/FIV tests. Fluid therapy and oxytetracycline were recommended. Three days later, the cat died. The main anatomopathological alterations observed were spleen and liver enlargement, pneumonia and fibrinous pleuris. Also in the present case, FeLV test was negative and FIV test was positive. Although **Hemobartonella felis** infection had been suspected, the infectious agent could not be found on the blood smear. The results of the hematological examination are presented on Tab. 1.

TABLE 1
Hematological data of cats infected by Feline Immunodeficiency Virus (FIV). São Paulo, 1992.

Values	Case nº1	Case nº2	Case nº3
Erithrocytes (x10 / mm)	6.40	4.30	3.80
PCV (%)	37	24	17
Hemoglobin (g/dl)	12.4	8.4	5.9
MCV (fl)	57.8	55.8	44.7
HCM (gg)	19.3	19.5	15.5
CHCM (%)	33.5	35.0	34.7
Leukocytes (x10 / mm)	23.9	27.6	61.9
Metamyelocytes	zero	zero	3095
Band neutrophils	239	1104	7428
Neutrophils	22088	253392	30950
Eosinophils	zero	zero	619
Limphocytes	1673	552	16094
Monocytes	zero	552	3714
Observations	...	C. Dohle	*

* Degeneration of cytoplasm of neutrophilis

DISCUSSION

As could be observed, the clinical signs showed by FIV infected cats were different from each other, but they revealed a simultaneous involvement of many organs and systems. Icterus, fever, anemia. Spleen enlargement or bacterial infections of many organs are frequently observed among domestic cats either as primary disease or as a consequence of previous viral infection.

The clinical picture described in the present cases is similar to that occurs in human immunodeficiency syndrome or in cats infected by FeLV or FIV (BARLOUGH [1], 1983; HAGIWARA et al.[2], 1989). The immunosuppresion caused by those viruses allows the installation of an opportunistic infection and in fact, bacterial infection by a usually non pathogenic bacteria could be found as the major cause of death in the second case and contributed to the worsening of the physical conditions of the third patient.

Cats infected by FIV are clinically staged as having either assymptomatic infection, AIDS related complex (ARC) or AIDS using a modification of criteria adapted from the Center for Disease Control classification system for HIV infections (SHELTON et al.[11], 1990). Cats with ematiation as observed in the first case or suffering from an opportunistic infection like as found in the second case and probably, in the third one, are considered to be AIDS patients.

Both, FeLV and FIV infections might lead to the appearance of AIDS (PEDERSEN et al.[9], 1990) but in the present cases a negative FeLV test revealed that the immunodeficiency was exclusively related to FIV infection. The presence of serum antibodies against FIV as observed in the cases described here has a meaning of active infection (PEDERSEN et al.[8], 1987; ISHIDA et al.[6], 1988). As occurs with other lentivirus infections, FIV has a singular property of remaining in the host organism in spite of the presence of circulating antibodies.

Bitting is thought to be the primary means by which transmission of the virus occurs, so that male cats are more prone to acquire FIV infection because they are more territorially agressive than females (YAMAMOTO et al.[12], 1989). The incidence of AIDS or AIDS related complex is higher among males than females in all parts of the world and probably, in Brazil. All cats studied were middle aged, in accordance to previous information stating that FIV infection is found more frequently among that group of cats (ISHIDA et al.[7], 1989).

The hematological alterations observed could be explained by marrow abnormalities that occur as a direct consequence of FIV infection or as a result of an opportunistic infection due to immunodeficiency. Lymphopenia, as described in the first and second cases is commonly found in cases of immunodeficiency syndromes in cats either due to FeLV or FIV infections (HARBOUR et al.[3], 1988), that might lead to lymphoid hypoplasia. Anemia as observed in the second and third case has been described elsewhere (SHELTON et al.[11], 1990) in about half of FIV infected cats. On the other hand, neutrophilia found in all of the three cases, could be explained by myeloid hyperplasia or more likely, as a response to secondary bacterial infection due to immunodeficiency status of the cats.

The description of FIV positive cases among the patients of the Veterinary Teaching Hospital at Faculty of Veterinary Medicine from the University of São Paulo is the first step of a large epidemiological study of the prevalence of FIV infection among cats in São Paulo, Brazil, which is being made currently.

RESUMO

Os aspectos clínicos e epidemiológicos de três casos de Síndrome de Imunodeficiência Adquirida dos Felinos (SIDAF), relacionados à infecção pelo FIV são descritos neste estudo. Dois dos animais eram gatos siameses, com três anos de idade sendo um macho e uma fêmea e o terceiro, um gato doméstico de pelo curto, macho, com seis anos de idade. Os sintomas observados foram febre, icterícia, esplenomegalia, emaciação e fraqueza. As principais alterações hematológicas foram a anemia, não relacionada à Hemobartonelose, encontrada em dois gatos, neutrofilia encontrada nos três animais e linfopenia observada em um. A necrópsia realizada em dois dos animais revelou que a sepse foi a maior causa da piora das condições clínicas nos gatos infectados pelo FIV. **Moraxella phenilpiruvica** foi isolada do rim de um dos animais. Todos os gatos apresentaram testes sorológicos positivos para FIV e negativos para FeLV e manifestavam há longo tempo sinais clínicos relacionados à SIDAF.

UNITERMOS: Síndrome de Imunodeficiência Adquirida Felina; São Paulo Brazil

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