

FELINE AIDS: SYMPTOMS AND TREATMENT

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INTRODUCTION AND SYMPTOMS

In 1987, Dr. Niels Pedersen (Davis, California) reported the isolation of a virus from diseased cats possessing the characteristics of a lentivirus (1). Since then intensive research has shown that the virus is of substantial veterinary importance, causing an immunodeficiency syndrome in cats. It also shares many physical and biochemical properties with HIV (2), and causes a disease with striking similarities to human AIDS (3). However, the virus is host specific.

Infections with FIV have been found worldwide, their incidence varying between 1% and 15% in healthy animals to between 3% and 44% in diseased cats (3,4). Infections with FIV are found mainly in older, free roaming, male cats. FIV can be recovered from blood, serum, plasma, cerebrospinal fluid and saliva of infected cats (2). Bites seem to be the most efficient and important mode of transmission. Horizontal transmission seems to be very inefficient and evidence for venereal transmission has never been obtained (5); *in utero* and neonatal transmission through colostrum, milk and maternal grooming is very uncommon.

After infection with FIV several stages of disease can be recognized. The acute primary stage is characterized by fever, persisting for a few days to several weeks, neutropenia and a generalized lymphadenopathy (2,3). Not every infected cat shows these signs. Normally, neutropenia lasts for 2 to 4 weeks; the generalised lymphadenopathy subsides after 2 to 9 months. Mortality is low at this stage; if the animals are co-infected with FeLV, however, mortality may increase to 50% (6).

A period of clinical normalcy follows that can be as long as 5 years (7). During this period impairment of immune function develops (8). A secondary stage is recognized with signs of an immunodeficiency-like syndrome. Often veterinarians see FIV infected cats for the first time which show vague signs of illness like recurrent fevers, emaciation, inappetence, lymphadenopathy, anemia, leukopenia and behavioral changes (3). In this stage the diagnosis of FIV infection is easily missed. Chronic secondary infections at some site in the body will develop. Symptoms most frequently observed (with the average percentage of incidence) are: chronic stomatitis/gingivitis (50%), weight loss (40%), lymphadenopathy (30%), leukopenia/anemia (30%), chronic upper respiratory tract infections (25%), chronic skin disorders (15%), chronic diarrhoea (10%, 3,7,9). These symptoms worsen over a period of months to years. They are the clinical reflection of an immunosuppression.

Finally, the cats may develop a stage comparable with AIDS in man, where anemia or pancytopenia, weight loss, severe emaciation, chronic

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disease problems, lymphoid depletion and opportunistic infections are evident. Most of these cats will die within months (7).

Miscellaneous other clinical features can be recognized in FIV infected cats (3). Neurological symptoms, several ocular conditions and immune mediated disorder like Coomb's positive anemia, thrombocytopenias and arthritis have been reported (9).

Lymphosarcomas and myeloproliferative disorders have been observed in a number of FeLV-negative but FIV-positive cats (10). Other tumors (i.e. squamous cell and mammary gland tumors) were reported in FIV positive cats with a higher than normal incidence (11).

Leukopenia due to an absolute granulocytopenia, and/or absolute lymphopenia, anemia, as well as other haematological abnormalities have been encountered in FIV positive cats, i.e. lymphocytosis and monocytosis, hypergammaglobulinemia (in 30%) and elevated levels of serum IgG (in 50%: 9).

TREATMENT

In most cases diseased cats respond to symptomatic and supportive treatment. But FIV infection is persistent and lifelong and the effect of treatment decreases with time. In the treatment of AIDS patients antiviral drugs, like azidothymidine (AZT), are used; AZT has been shown to prolong the survival of AIDS patients and improve their quality of life (12). Various steps in the replication cycle of the virus can serve as a target for chemotherapy. AZT is a nucleoside analog that inhibits the viral reverse transcriptase. This and other nucleoside analogs like phosphonomethoxyethyl adenine (PMEA) operate at the level of the synthesis of DNA from the viral RNA template. Also in cats the effect of antiviral drugs has been studied (13, 14). The reverse transcriptase (RT) of FIV is similar to that of HIV-1 in its sensitivity to several antiretroviral compounds. AZT and other acyclic purine nucleoside analogues e.g. PMEA were shown to inhibit FIV replication *in vitro* and *in vivo* also (13, 14). PMEA and AZT (both 5mg/kg/day) were administered subcutaneously twice daily for a period of 3 weeks and both showed a pronounced effect on the opportunistic infections accompanying FIV persistence; the animals general health improved. Antiviral chemotherapy does not eliminate FIV from the cat's body and recurrence of the symptoms is noted. However antivirals extend the lives of FIV patients although they should still be considered as potential transmitters of the virus. Therefore, epidemiological considerations make therapy less desirable in cat colonies. As in man, toxic side effects like anemia have also been observed in cats. FIV infected cats can be considered as a useful model for the screening of antiviral drugs; eventually effective drugs may also find their way into veterinary practice.

THYROID CANCER RESEARCH IN THE DOG: ANNO 1992

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INTRODUCTION

Among all animal species, the dog is probably the species in which thyroid cancer is the most frequent. In this species, thyroid tumors comprise only 1 to 2% of all tumors in autopsy surveys but are the most frequent endocrine neoplasm (1, 10). They represent an important clinical problem, since approximately 90% of the clinically detectable tumors are malignant. Adenomas are mostly smaller than 2 cm and consequently often not diagnosed in the living animal. They comprise

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one-third of all canine thyroid neoplasms found at necropsy (6). Thyroid cancer is found more often in boxers than in any other breed (1) and occurs mostly in elderly dogs (average 9-10 years) (3, 6). Solid and solid follicular histomorphologic patterns are by far the most common (75-80%), followed by pure follicular carcinomas. Other histologic types are rare (5%) (6).

Thyroid cancer metastasizes mostly in the lungs and, to a lesser extent, to the regional lymph nodes. Clinical evidence of metastasis is present at first admission in 31-38% of the cases of invasive tumors have been