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FELINE VIRUS DISEASES

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The importance of the virus-caused diseases of the cat was emphasized with the advent of the sulfonamides and antibiotics. These chemotherapeutic agents can destroy or effectively control many of the bacterial diseases, but they do not markedly reduce the severity of the viral diseases. It is now known that cats are susceptible to

a great variety of viral diseases. The recent advancements in the techniques of tissue cell culture has greatly enlarged our knowledge of these viruses and our ability to control them with preventative measure. The use of cell cultures allow research workers to grow viruses outside of the animal's body and thus expands the tools at their command to study the needs of the organism for growth and reproduction. Ultimately, with these tools, chemotherapeutic agents may be found that will be as effective against viruses as are the antibiotics against the common bacteria. Already work is being carried out on some promising agents. Many of the viruses which flourish in the cat's body are not as yet completely characterized. By this is meant that we do not know their size, composition, growth requirements or whether or not they regularly produce disease or are disease producers only under special circumstances. This important work is being done at many laboratories throughout the world; however, it is painstaking, slow work; and results are not dramatic. In recent years, much has been learned about feline virus diseases; much more remains to be discovered.

Several important feline viral diseases have been rather fully characterized — rabies, pseudorabies, panleucopenia and the upper respiratory or rhinotracheitis complex. The first two are of less frequent occurrence than the latter two and will be discussed in much less detail.

RABIES

Rabies occurs in cats only about one-fifth to one-tenth as frequently as in dogs. The transmission of rabies from cat to cat or from cat to other animals seems comparatively rare. If the chief sources of rabies infection, — dogs, wild animals or bats — are eliminated, rabies infections in cats will disappear.

Cats, like dogs, may exhibit either the furious or paralytic (dumb) form of rabies; however, cats that become rabid usually exhibit the disease in the furious form with a marked tendency to bite and claw.

Once symptoms have been observed in the cat, the disease is fatal. Because of this and because of the fact that the rabid cat is a real threat to man, cat owners should be certain that their animals are vaccinated against rabies.

There are several quite effective rabies vaccines for cats available to the veterinarian. Basically these are of three types. Cats can be effectively immunized with phenolized nervous tissue vaccine or a new phenolized hamster cell culture vaccine can be used. This latter vaccine is a product of research using the cell culture technics previously mentioned. The third type of rabies vaccine for cats is a living modified virus vaccine called the high egg passage (H.E.P.), chicken embryo vaccine or H.E.P. Flury vaccine. This is a safe modification of the low egg passage (L.E.P) vaccine so widely and successfully used to vaccinate dogs. Under no circumstances, should the L.E.P. vaccine be used for cats, since under certain conditions, this vaccine can produce a form of rabies in the cat.

Your veterinarian will recommend when to first vaccinate your cat. Usually, this will be when the cat is four to six months of age, but in areas where rabies is a serious problem, the veterinarian may recommend earlier vaccination.

Further research is necessary to determine exactly how long following vaccination that the cat is immune to rabies; however, at the present, regardless of the type of vaccine used, cats should be re-vaccinated yearly.

PSEUDORABIES

Although pseudorabies or Aujeszky's disease occurs in cats in Europe and is a relatively wide-spread disease of other animals (pigs, cattle, rats and even dogs) in the United States, no cases of the disease have been reported in cats in the United States. The disease in cats may be transmitted by the ingestion of infected rats; and since there is a relatively high infection rate in rats in certain areas of the midwestern United States, it is surprising that we do not hear of cases of pseudorabies in cats in this area.

Like rabies, once symptoms of pseudorabies have been observed, the disease is fatal and death will occur within 24-48 hours after the onset of symptoms.

No disease produces symptoms as dreadful as pseudorabies. The virus attacks the nervous system and this results in a severe localized pruritis or itching; thus the pseudonym "mad itch." The cat will lick incessantly at some part of the skin and as the irritation increases, he bits, gnaws and rubs this area, mewing plaintively as if in severe pain. The skin is raw, torn and bleeding. As in rabies, there is some pharyngeal paralysis and drooling may be marked.

We should feel exceedingly fortunate that this disease apparently has not appeared in cats in the United States. It is extremely important that any signs suggestive of this disease be reported promptly to your local veterinarian so that steps to control the spread of the disease can be taken immediately.

PANLEUCOPENIA

Panleucopenia is perhaps the oldest commonly recognized viral disease of cats. In fact at one time, it was considered to be the cause of almost all deaths of kittens and young cats. The disease is commonly called feline distemper, cat flu, show fever and by other more colorful terms. The use of all of these pseudonyms is to be discouraged as it leads to confusion. Panleucopenia is preventable and, if treat-

ment is commenced at the first sign of disease, it is curable; thus, it is very important that all possible sources of confusion be eliminated.

Panleucopenia may occur in cats of any age; however, it is by far most common in kittens from just after weaning up to a year or eighteen months of age. The disease may occur in a peracute form in the weanling. In this form of the disease, the kitten will be seemingly normal one evening and found dead or moribund early the next morning. Many owners feel sure that the kittens have been poisoned, but panleucopenia should be suspected first under these circumstances. A veterinarian can diagnose the condition by a blood examination of the living cat or often by examination of the bone marrow of a recently deceased kitten.

An acute form of the disease is more common than the peracute. The onset is sudden. The kitten is markedly depressed and refuses his food. If the temperature is taken at this time, it will be found to be very high — 104-106°F.

The fever remains high for perhaps a day and then drops toward normal for a day and the kitten may appear to feel a little better. Then the fever rises again, depression becomes severe; the kitten may be hardly able to raise his head. Vomitting and diarrhea may accompany the depression and fever. The kitten often lies stretched out on his abdomen and cries as if the abdomen is painful. He will try to drink water, but often cannot retain it. The skin appears lifeless and the hair coat dull. This is due to dehydration or loss of body fluids accentuated by the vomitting and diarrhea. There is also marked weight loss. Although rarely kittens may recover from panleucopenia without treatment, the majority die within one to three days after signs of illness have been noticed.

The clinical signs of panleucopenia are relatively characteristic once they become pronounced; even so, other diseases of the cat may appear quite similar. In order to make an early diagnosis when treatment will be most effective, a blood sample is imperative. As the name panleucopenia, implies, there is a marked decrease in all of the white blood cells or leucocytes. The normal cat has a white blood cell count of approximately 8,000 to 25,000 cells per cubic millimeter. Any count below 5,000 cells per cubic millimeter is suggestive of panleucopenia and it is not unusual to see counts as low as 500 to 1,000 cells per cubic millimeter in kittens with panleucopenia. The white blood cells are one of the body's chief defense mechanisms against infection. When these cells are destroyed by the panleucopenia virus, the kitten is very susceptible to all kinds of problems; thus, one can understand why prompt treatment is so essential in this disease. Other, rarer diseases of the cat will also produce a reduction in the total white blood cell count; however, a characteristic of panleucopenia is that the granulocytic leucocytes (the polymorphonuclear cells) are decreased more than are the lymphocytes and monocytes (the mononuclear cells). For this reason, another common pseudonym for panleucopenia is agranulocytosis (i.e. without granulocytes). Any question regarding diagnosis of this disease can be answered by a blood examination.

If treatment is commenced immediately, at the first evidence of

fever, antiserum may be effective. It is not effective later in the course of the disease. Whole blood transfusions and fluids and electrolytes to combat the dehydration are also essential parts of the treatment of a sick kitten. Broad-spectrum antibiotics are usually advocated. These drugs do not affect the virus, but provide some protection against bacterial secondary invaders during the period when the cat's resistance is depressed because of the low white blood cell count. Vitamins and other supportive therapy may also help during the crucial stages of the disease. Since vomiting is a common sign of panleucopenia, many affected kittens cannot retain medicines given by mouth and all early treatment must be given by injection. Treatment for the first two or three days must be heroic if the kitten is to be saved. Recovery, once the crisis is past, is fairly rapid, but the kitten must be provided with plenty of nutritious food to gain back the weight lost during his acute illness. He must also be protected from any stressing situations for a week or more following apparent recovery. A transient diarrhea may follow the crisis and this may be treated symptomatically.

Even with the most heroic treatment, too many kittens succumb to panleucopenia. The disease is so explosive that by the time owners realize the kitten is ill, it is just too late. This is doubly unfortunate because the disease can so easily be prevented by proper vaccination. There are several types of vaccines available — all are of proven effectiveness. Kittens normally should be vaccinated shortly after weaning. Most queens have been vaccinated and they pass some of this protection on to the kittens in the form of antibodies in their milk. These antibodies protect the kittens for the first five or six weeks of their life. This is, of course, dependent upon the number of antibodies in the milk, which is dependent upon the degree of immunity of the queen. While protected by these maternally transmitted antibodies, the kitten is unable to respond to vaccination and this explains why vaccination is delayed. The ideal time to vaccinate a kitten varies among individuals and will depend upon many factors such as the immunity of the queen, the chance of exposure to disease, and the like. It is important that the cat owner and veterinarian discuss these problems and solve them while the kittens are quite young. By working together, a program can be established that will prevent panleucopenia. Such a program should consider the necessity for revaccination so that all animals are completely protected at all times. In no other disease does the axiom "an ounce of protection is worth a pound of cure" hold so true.

A special note should be made here regarding the use of mink enteritis vaccine for the prevention of panleucopenia. Mink enteritis is a virus disease of mink which is so closely related to panleucopenia that antibodies against the one will protect against the other. Mink enteritis vaccine has proven to be as effective as other vaccines against panleucopenia. Mink enteritis vaccine is prepared in a base that is absorbed from the tissues slowly so that one injection takes the place of the two injections at weekly intervals used for most panleucopenia immunization. Because of this slowly absorbed base, when the vaccine is given just under the skin, a small knot about one quarter of an inch in diameter may develop at the site of injection. It may

take up to one month, although usually less, for this "lump" to be absorbed, but it is no cause for concern.

If all cat owners realized how effective panleucopenia vaccination can be, this disease could be eliminated as a cause of extreme mortality among kittens. It is indeed unfortunate that when such effective disease control is possible, it is not utilized to its full extent.

UPPER RESPIRATORY VIRUS DISEASES

Just as the human "cold" is the most common disease of man, the feline upper respiratory virus diseases are the most common disease problem of the cat population. These two "Problems" have much in common. Neither syndrome is caused by a single virus, but rather a number of different viruses are capable of producing identical symptoms. Both diseases may re-occur in the same patient — a single attack does not immunize. In neither case is a totally effective vaccination available. Both conditions are characterized by sneezing, "runny noses," and "watering eyes." Both conditions are prevalent in crowded populations and a stress such as chilling may accentuate the symptoms of either condition. All degrees of severity from very mild and transient to very severe, even fatal, may be found in both syndromes. Treatment of the upper respiratory virus diseases of the cat is as effective as treatment of the human cold. Although both patients can be made more comfortable by good nursing care, neither can be cured.

Any implication that man's "cold" can be transmitted to his cat or that man can get one of the cat's upper respiratory viruses is emphatically denied at the present time.* The same viruses are not involved, even though the conditions seem to have much in common.

As mentioned, a great number of viruses have been isolated from cats showing signs of upper respiratory infection. Many of these viruses have not been completely characterized; several have been. Although the name, Feline Viral Rhinotracheitis, refers to an upper respiratory disease produced by one specific, well-characterized virus of this group, it is a good descriptive term to use for all of these conditions. Rhinotracheitis means an inflammation of the nasal passages and the trachea, the upper part of the respiratory tract. Feline pneumonitis is a term used to describe another respiratory disease of cats produced by another well-characterized virus. On the basis of clinical signs alone, it cannot be distinguished from Feline Viral Rhinotracheitis. The term pneumonitis means inflammation of the lung and since this does not usually occur in Feline Pneumonitis, the name is confusing. The terms, feline distemper and feline influenza have also been used to describe these upper respiratory virus diseases of the cat; the use of all of these terms should be discouraged. For the following description of the disease syndrome, the term rhinotracheitis will be used. The reader should understand that the term is being used to describe a clinical syndrome that may be produced by any one or more of a wide variety of different viruses.

*A number of years ago, an interesting outbreak of virus disease among cats and children on a New England farm was described in a medical journal. It was never proven without doubt that the virus was the same in both species; and to date, the only virus disease of cats that is known to be transmissible to man (and vice versa) is rabies.

Feline rhinotracheitis may affect cats of any age; however, the disease tends to be far more severe in young kittens. There is no such thing as a typical case of rhinotracheitis. Some kittens may throw off the effects of the disease in one or two days; others may be so severely affected as to succumb to the disease; however, a general description of symptoms can be given.

Sneezing is the most characteristic sign of the disease. For the first day or two, this may be the only sign of illness noted. Fever and slight depression may occur at first, but a high persistent fever is not characteristic. A watery nasal discharge and discharge from the eyes may be noticed early in the course of the disease and in a few days, these discharges become thick, drying on the nose and interfering with the cat's ability to breathe easily, or drying on the eyes so that the cat cannot open one or both eyes. In the very young kitten, a persistent, untreated ocular discharge of this nature may lead to permanent damage to the cornea—the clear portion of the eye—and blindness. By the time the discharges become thick, the cat is quite ill; his sense of smell is not as good as normal and thus he is not interested in food or he may "pick" at his food. He cannot breathe easily; he tries to rub the discharges from his nose and eyes and often in this process, stains the forepaws with these discharges. In severe cases, ulcers develop on the tongue and the pain of these ulcers causes excessive drooling and a further lack of desire to eat. The disease lasts from two to four weeks; and if a young kitten or even adult cat does not eat for this entire period, the tremendous weight loss that accompanies this disease is easily understood. Feline Rhinotracheitis is seldom fatal in itself, but the cat is so debilitated that, if the disease is not treated, he is prey to complication. If the kitten is not vaccinated, panleucopenia may attack and destroy in the wake of rhinotracheitis. A common fatal aftermath of rhinotracheitis is a bacterial meningitis or inflammation of the covering membrane of the brain. A chronic infection of the sinuses with resultant loss of condition and sneezing that may last for months may follow an attack of rhinotracheitis.

The viruses that may produce Rhinotracheitis are, for the most part, not good antigens. That is, a cat affected with one of these viruses does not produce many antibodies against that virus. For this reason and because many viruses may be involved, a cat that has recovered from one attack of rhinotracheitis may suffer another attack within weeks or months. Fortunately, as a general rule, second and subsequent attacks tend to be less severe than the first attack.

There is no characteristic blood picture in the case of Feline Rhinotracheitis, but a veterinarian treating an infected cat often wants a blood sample. It will tell him how the cat's body is responding to the infection; and perhaps more important, in the young kitten, he will be able to tell if panleucopenia is complicating the infection and so determine the most appropriate treatment.

There is no one specific treatment for Feline Rhinotracheitis, since no therapeutic agent as yet discovered will destroy the virus. An exception to this statement could be made in the case of true Feline Pneumonitis. That particular virus, which goes by the name of

Myogawenella felis is large as viruses go and is susceptible to some of the broad spectrum antibiotics. On the chance that this particular virus is causing the problem and also to destroy the complicating bacteria, and thus prevent such disasters as meningitis, veterinarians prescribe broad spectrum antibiotics for the treatment of rhinotracheitis.

The most important part of the treatment of Feline Rhinotracheitis is good nursing care. Veterinarians may refer to this as symptomatic treatment, which is really a little broader term. Good nursing care in the case of Feline Rhinotracheitis means diligent washing of the nose and eyes to remove the crusts and application of an antibiotic cream to both areas to soften and protect them. Mild decongestive nose drops may aid the cat's breathing. Clean, warm, draft-free quarters must be provided the cat and he should be encouraged to eat by providing him with a variety of special treats. If the cat continues to refuse to eat, the veterinarian can force-feed him by passing a stomach tube. It is essential, because of the long course of the disease, that the sick cat receives adequate nutrition.

Again, with one exception, the viruses that produce the syndrome of Feline Rhinotracheitis are poor antigens and again, since many viruses are involved, there is no vaccine available that will prevent all types of Feline Rhinotracheitis. The one exception is again the virus of Feline Pneumonitis and a vaccine is available to prevent this disease. The isolation and characterization of feline viruses is expensive and time consuming work. Unfortunately, the practicing veterinarian cannot do this in his office any more than the practicing physician can isolate and identify the various cold viruses in his office. Catteries which have problems with rhinotracheitis may choose to vaccinate their cats with pneumonitis vaccine. If the particular infection in the cattery is true Feline Pneumonitis, vaccination will help. If it does not help, then it can be assumed that another virus is involved. Further research may provide an easier method to distinguish these viruses and a more complete vaccine, but neither appears to be forthcoming immediately.

Feline Rhinotracheitis is a very common problem where cats and kittens are crowded, where nutrition and sanitation may not be the best or where any other stressing factor exists. At the present, the best method of control involves scrupulous sanitation, good nutrition, keeping adult cats (which may be carriers of the disease) separated from the younger animals. Well separated, roomy, well ventilated, but draft-free quarters for individual animals, a queen and her kittens, or at most, two or three weanling kittens, will markedly reduce the incidence and severity of Feline Rhinotracheitis in a well-managed cattery. Sneezing cats must be isolated immediately, as the virus is rapidly spread in the air-borne droplets from the sneeze of an infected cat.

Catowners must become aware of the more common diseases of the cat. Particularly, they must know what can be done, how it can be done and when it is to be done to prevent these diseases. Treatment of the virus-caused diseases of the cat is, in many ways, disappointing; but these diseases can be prevented. If proper attention is devoted to

preventing these diseases, much heartbreak can be avoided. The cat owner and the veterinarian must work hand in hand, so that each fully understands the individual problems and their solution.

Much research remains to be done in the field of feline virus diseases. Much is being done. New and better prophylactic agents are constantly being developed; effective antiviral chemotherapeutic agents are appearing, and the viruses themselves are being studied. The years to come promise to be bright ones for the ultimate conquest of virus diseases.

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