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Contributors: Dr. Earle Goodman, Editor. Dr. Leroy Dorminy, Co-Editor.

Note from the Editor

In this issue we focus on the health problems of dogs and cats. Although we usually put a priority on topics related to farm animals, we often have requests to cover the health problems of pets. In all topics we attempt to bring out the zoonotic aspects (diseases of animals which affect human health).

There are still free newsletter subscriptions available, and we encourage our subscribers to share this material with others. We also continue to encourage reader's comments and suggestions. We especially appreciate receiving any useful news items and practical information that might be of interest to others.

Influenza Emerges As A New Clinical Disease In Dogs

Adapted from the Texas A & M University Extension Veterinary Newsletter

Canine influenza is being described as a new and possibly significant disease in dogs that mimics kennel cough but is more serious. (Some excellent information sources on canine influenza are included under the "Web Resources" section on page 8).

According to these sources, this new canine influenza virus (CIV) is most similar to the classic H3N8 influenza virus of horses. The H3N8 equine virus was identified 40 years ago and has not been

documented to be zoonotic. CIV is not known to be zoonotic either and, because it is very similar to the equine virus, it is not likely to mutate to become transmissible to humans.

CIV is highly infectious and will affect any dog exposed to it. Transmission is thought to be through aerosol droplets from sneezing and through contaminated objects, clothing and footwear. The incubation period is 2 to 5 days. Most dogs have a mild form of "flu," but some develop acute Pneumonia with high fever (104 to 106 degrees F) and rapid, difficult breathing. Eighty percent of affected dogs will have clinical signs (20 percent will be infected, show no clinical signs, shed the virus and silently spread infection). The most common clinical sign in the mild form is a cough that persists for 10 to 21 days despite all therapy. Most dogs have a soft, moist cough while others have a dry cough similar to that caused by the kennel cough agents. The mortality rate is 1 to 8 percent. Infected dogs may shed the virus for 7 to 10 days from the start of clinical signs. Suspected patients should be isolated to prevent spread of the disease. A 10% bleach solution will most likely destroy this enveloped virus (bleach is also used for canine parvovirus disinfection).

No rapid, real-time diagnostic test is available for acute infection. Detection of antibodies to CIV that are present as early as 7 days after onset of clinical signs is the main diagnostic method used. Paired acute and convalescent serum samples are necessary for diagnosis of recent infection (with the convalescent sample collected 2 weeks after the acute sample). If collecting an acute sample is not feasible, testing a convalescent sample is still of value because a positive will indicate whether a dog was infected some time in the past and will alert the veterinarian that CIV infection is circulating in the community dog population.

Treatment with antiviral agents early in infection may be effective, but this is unknown at present. Antibiotics for secondary infections, as manifested by a nasal discharge, should help shorten the course of the disease. Cough suppressants may be helpful. Maintaining hydration is also very important. No vaccine is available, but researchers are working toward this goal. Para-influenza virus contained in kennel cough vaccines gives no cross protection against CIV infection.

How To Prevent Transmission Of Intestinal Parasites From Pets To Humans

Adapted from Vet Med July 2002, The Extension Veterinary Medicine Newsletter of Iowa State University, USA

Most pet owners do not know that intestinal worms of pets may infect people; therefore, they may have neither the knowledge nor the incentive to take precautionary measures.

Preventive anthelmintic deworming is most effective in preventing environmental contamination and human illness when it is aimed at pups and kittens and their dams because they harbor the most worms and thus produce the most infective-stage larvae.

For optimal prevention of environmental contamination and illness in pups and kittens, initiate anthelmintic treatment soon after birth. Where both ascarids and hookworms are commonly transmitted, anthelmintic drugs should be given to pups at ages 2, 4, 6, and 8 weeks of age. If only ascarids are present, preventive anthelmintic treatments may begin at 3 weeks of age. In kittens, because prenatal infection does not occur, egg excretion begins later than in pups, and in most areas, rates of acquisition of ascarids and hookworms by cats are comparatively lower; therefore, preventive treatment for kittens can be started effectively at 6 weeks of age and be repeated at 8 and 10 weeks. Treat nursing dams concurrently because they often develop patent infections about the same time as their offspring.

For the earliest treatments provide clients with medication to administer to their pets at home. Thereafter, in areas where heartworm (Dirofilaria immitis) infection is enzootic, ascarid and hookworm prevention can be maintained in dogs by using one of the heartworm prevention medications that are also effective against intestinal nematodes. Control in older dogs and cats can also be achieved by periodic treatments with drugs whose efficacy is limited to intestinal nematodes, or by treatments

based on the results of periodic diagnostic stool examinations.

Choose from a great variety of anthelmintic drugs that are safe and effective against ascarids, hookworms, and other intestinal helminths of dogs and cats. The drugs are available in tablet, granule, liquid, and other formulations, with single or multiple daily doses and periodic or continuous administration. Select on the basis of the compound's effectiveness against the range of helminth species prevalent in an area. For preventive treatment of very young pups, give an anthelmintic approved for nursing pups (2-3 weeks of age). The drug should be effective against both ascarids and hookworms (unless one or the other of these species is not present in a particular area).

The prophylactic approach to treatment is justified by the frequency with which pups and kittens acquire ascarids and hookworms from their dams and the difficulties in diagnosing these infections in their early stages. Severe illness and even death may occur before prenatal or lactogenically acquired ascarids and hookworms become gravid and can be diagnosed by stool examinations. Because many pups and kittens are not brought to a veterinarian before 6-8 weeks of age, delaying treatment until that time allows infections to become patent and contaminate the environment with eggs or larvae. Because young animals acquire new infections continuously from the dam's milk and from the environment and many worms are not yet fully mature, fecal examinations are often falsely negative in pups and kittens.

Educating and Counseling Pet Owners
Pet owners should be informed about intestinal parasites and their effects on the health of pets and people. Pet owner education should provide the following information:

• Types of intestinal helminths that infect dogs and cats, and the illnesses they cause in these pets.
• How intestinal helminths are transmitted to dogs and cats, with special emphasis on helminths acquired through prenatal (T. canis) and transmammary (A. caninum, T. cati and, to a limited degree, T. canis) routes.
• How ascarids and hookworms can cause problems in humans, especially children, whose play habits and attraction to pets put them at increased risk.

Zoonotic Transmission of Ascarids and Hookworms (Internal Parasites) in Dogs and Cats

Adapted from Penn State Veterinary News, Cooperative Extension Service, Nov. 1997

Ascarids (Toxocara spp.) and hookworms (Ancylostoma spp. and Uncinaria stenocephala), the most common intestinal worms of dogs and cats, can cause larva migrans syndrome in persons who accidentally ingest eggs or larvae or have direct skin contact with hookworm larvae in soil contaminated with the feces of infected animals. Pups and kittens are often infected by transfer of larvae from their dams in utero (T. Canis) or via milk (A. Caninum, T. Cati, and to a lesser extent, T. Canis) and the tissue-migrating and early intestinal stages of these worms may cause severe, sometimes life-threatening, disease in the first few weeks of the animal's life. Furthermore, pups and kittens may have patent intestinal infections as early as the first 2 (hookworms) to 3 (ascarids) weeks of life, and may contaminate their environment with huge numbers of infective eggs and larvae. The prevalence of these infections varies with climatic conditions; however, they are present in all parts of the world and must be viewed as a potential public health hazard.

The common ascarid of dogs, T. Canis, has long been recognized as a cause of larva migrans syndrome in children. The ascarid of cats, T. Cati, can also cause disease in humans, although for reasons partly related to the "toilet behavior" of cats, it does so less frequently than T. Canis. When the eggs are accidentally ingested, they hatch, and infective-stage larvae migrate through human liver, lungs, and other organs and tissues where they produce damage and induce allergic responses. Infection may leave children with permanent visual or neurologic damage.

The popularity of pets together with high ascarid and hookworm infection rates in dogs and cats, especially pups and kittens, can result in widespread

contamination of soil with infective-stage larvae. Epidemiologic studies have implicated the presence of dogs, particularly pups, in the household and pica (dirt eating) as the principal risk factors for human toxocaral disease. Children's play habits and attraction to pets put them at high risk for ascarid and hookworm infection.

Hookworms of dogs and cats (A. Caninum, A. Braziliense, A Tubaeforme, and U. Stenocephala) can also infect people when larvae in soil are ingested or directly penetrate the skin on contact. Cutaneous larva migrans syndrome, characterized by progressive, intensely pruritic, linear eruptive lesions caused by prolonged migration of the larvae in the skin, is the most common manifestation of zoonotic hookworm infection. A. Canium larvae may penetrate into deeper tissues, however, and induce symptoms of visceral larva migrans or migrate to and partially mature in the intestine, inducing eosinophilic enteritis.

Veterinarians are in an optimal position to assist pet owners because of their unique training, frequent contact with pet owners, and their rapport with clients. Veterinarians should provide counseling for dog and cat owners and well-timed preventive anthelmintic treatments for pets.

Prevent the transmission of intestinal ascarids and hookworms from pets to people. Avoid environmental contamination by emphasizing good hygiene and sanitation and providing well-timed preventive treatments, especially for pups and kittens.

Zoonosis Update: Cat Scratch Disease And Other Zoonotic Bartonella Infections

Adapted from JAVMA Vol 224 No.8, April 15 2004
Bruno B. Chomel, DM, PhD; Henri Jean Boulouis, DVM, MS; Edward B. Breitschwerdt, DVM, DACVIM

Since the early 1990s, there have been substantial advances in the understanding of the etiology, reservoir potential, vector transmission, and pathogenesis of bartonellosis in cats, dogs, and humans. Bartonella spp are fastidious, hemotropic, gram-negative organisms that have been recently identified in a wide range of domestic and wild mammals. These organisms are considered to be emerging zoonotic agents. Bartonella spp are usually vector borne, and the vector varies with the Bartonella spp involved (eg, sandflies for B. bacilliforrnis or human body lice for B. quintana). Fifty years ago, cat scratch disease was identified in France and described by Debre et al. It is now known that this common zoonosis is caused by a bacterium of the genus Bartonella and not by Afipia felis. Cats are the main reservoir of this bacterium, which is transmitted from cat to cat via the cat flea (Ctenocephalides felis). Several new Bartonella spp or subspecies have been identified in domestic cats and dogs and free-ranging or captive wild feuds or canids. Furthermore, many new species of Bartonella have been identified in a wide range of mammals, including rodents and ruminants. There is also an increasing number of reports of infections in humans and dogs caused by Bartonella spp associated with rodents.

Epidemiology

Humans - Cat scratch disease, caused by B. henselae, has a worldwide distribution. However, it is not a reportable disease in humans in most countries. Therefore, sufficient data to determine the exact incidence or prevalence of Bartonella infections are not available. These observations suggest that severa1 thousand cases of cat scratch disease may occur every year in many countries. Overall, cat scratch disease is more likely to occur in children and young adults. Transmission from cat to human mainly occurs via cat scratch or bite; less frequently, transmission could be via a flea bite or a tick bite.

Cats - Domestic cats are the main reservoir of B. henselae. Seroepidemiologic studies have revealed worldwide distribution of B. henselae infection in domestic cats, with 4% to 80% of cats having antibodies against B. henselae (according to the geographic location). Domestic cats can be bacteremic for several weeks to a few years. Results of epidemiologic studies have indicated that the prevalence of bacteremia in cats ranges from 15% to 55% in Australia and many other countries in the Americas, Europe, Asia, and Africa. The prevalence of bacteremia in young cats (<1 year old) is usually higher than in adult cats.

Direct transmission from cat to cat in a flea-free environment and vertical transmission from infected queens to their kittens has not been detected. Warm and humid climates are strongly associated with the presence of antibodies against B. henselae and ectoparasite infestation in cats, further supporting arthropod vector involvement in transmission. The cat flea, C. felis, plays a major role in cat-to-cat transmission of B. henselae.

Dogs and wild canids - In California, coyotes (C. latrans) are a major reservoir of B. vinsonni. In a study by Pappalardo et al, domestic dogs that were seropositive against Bartonella were 14 times as likely to have a history of heavy tick exposure, 9 times as likely to have been exposed to cattle, 7 times as likely to be from a rural than an urban environment, and almost 6 times as likely to have a history of heavy flea exposure, compared with dogs that were seronegative.

Clinical Features

Humans—In immunocompetent patients, cat scratch disease caused by B. henselae is mainly characterized by a benign regional lymph-adenopathy. Seven to 12 days after receiving a cat scratch (or a bite), a papule and then a pustule develop at the inoculation site. Regional lymph-adenopathy develops 1 to 3 weeks after the inoculation and can persist for a few weeks to several months. Atypical manifestations may develop in 5% to 15% of humans with cat scratch disease; these may include Parinaud's oculo-glandular syndrome, encephalitis, endocarditis, hemolytic anemia, hepatosplenomegaly, glomerulo-nephritis, pneumonia, relapsing bacteremia, and osteomyelitis. Cat scratch disease encephalopathy, which is possibly associated with immune-mediated symptoms caused by B. henselae, is one of the most severe complications of cat scratch disease. Patients with cat scratch disease encephalopathy usually completely recover within 1 year without any sequelae. Bartonella henselae was also recently identified as a frequent cause of prolonged fever and fever of unknown origin in children. Rheumatic manifestations of Bartonella infection have also been described in children, including 1 case of myositis and 1 case of arthritis and skin nodules. Arthritis has also been described in a limited number of cases.

Cats - Because of the high prevalence of infection with B. henselae in cats, it has been difficult to associate infection with specific clinical signs. However, cats that were experimentally infected with B. henselae (mainly type-Il feline isolates) developed various clinical signs. Fever was one of the most commonly observed clinical signs that usually developed within a few days of infection and persisted for 2 days to a few weeks. Local inflammation (erythema and swelling) at the site of inoculation and lymphadenopathy were also observed. Lethargy and anorexia have also been reported in experimentally infected cats. As reported for certain humans infected with B. henselae, some cats also developed CNS disorders.

Dogs—Bartonella vinsonii subsp berkhoffii has been identified as an important cause of endocarditis in dogs and was reported to be the cause of endocarditis in a human. The known clinical spectrum of this infection in dogs continues to expand and includes cardiac arrhythmias, endocarditis, myocarditis, granulomatous lymph-adenitis, and granulomatous rhinitis. In 12 dogs with cardiac arrhythmias, endocarditis, or myocarditis, 11 were seroreactive to B. vinsonii subsp berkhoffii; in 3 of those 11 dogs, results of PCR assay and DNA sequencing confirmed that the lesions were caused by B. vinsonii subsp berkhoffii. In humans and dogs, Bartonella-associated endocarditis usually involves the aortic valve and is characterized by massive vegetative lesions. Of the dogs diagnosed with endocarditis during a 2-year period at 1 veterinary teaching hospital, Bartonella infection was implicated as a causative agent in almost a third. On the basis of serologic findings, infection with B. vinsonii subsp berkhoffii may also cause polyarthritis, neutrophilic or granulomatous meningoencephalitis, immune-mediated anemia, thrombocytopenia, and eosinophiia in dogs. Nevertheless, B. vinsonii subsp berkhoffii has also been isolated from clinically healthy dogs which may be long-term carriers of the bacterium.

Treatment

In humans with B henselae infection, treatment with

antimicrobials for immunocompetent patients with cat scratch disease differs from that for immunocompromised patients with angiomatous proliferative diseases. For immunocompetent patients, numerous antimicrobial agents have been advocated for the treatment of typical cases of cat scratch disease. However, in most instances, administration of antimicrobials does not appear to improve response to or shorten the duration of the infection. Azithromycin, rifampin, ciprofloxacin, and trimethoprim-sulfamethoxazole were effective in the improvement of clinical features associated with infection, but penicillins, cephalosporins, tetracyclines, and erythromycin had minimal or no clinical efficacy. In humans with Bartonella-associated endocarditis, effective antimicrobial treatment should include an aminoglycoside administered for a minimum of 2 weeks.

Prevention

The most effective means of preventing B. henselae infection are common sense precautions, hygiene, and possibly modification of behavior of the cat owners themselves. For example, it is recommended that cat owners wash their hands after handling pets and clean any cuts, bites, or scratches promptly with soap and water. Development of a feline vaccine to prevent the spread of infection in cat populations and reduce human risk of infection may be considered.

FDA Approves First Injectable Solution for Sterilization in Dogs

Adapted from Virginia/Maryland Veterinary Notes No. 108 Oct.-Dec. 2003

The FDA has approved the first product for chemical sterilization of 3 to 10 month old male puppies. The drug, Neutersol Injectable Solution (zinc gluconate neutralized by arginine), provides an alternative to surgical castration and may prove to be a valuable aid in efforts to control burgeoning dog populations.

Neutersol, administered by direct injection into the testicles, is a necrotizing agent that has a local effect when injected into the testicle. Based on histopathology, one or more of the following actions accounts for the drug's effectiveness: 1) Atrophy of the testicles, epididymides, seminiferous tubules, and prostate gland and 2) Scar tissue formation which prevents movement of sperm from the seminiferous tubules to the epididymis. Neutersol does not require the use of general anesthesia, though sedation is recommended to prevent the dog from moving during injection.

The effectiveness of Neutersol was evaluated in a field study of 270 male puppies between 3 and 10 months of age. Of the 270 puppies enrolled, 224 completed the study to month 6 and were included in the analysis. One injection of Neutersol in each testicle produced successful chemical sterilization in 223/224 (99.6%) puppies, as determined by serial semen analyses. In a study conducted in laboratory beagles, effectiveness was confirmed up to 24 months post-injection.

Proper injection technique and postinjection care are critical for the safe use of the product. According to Dr. Elizabeth Luddy, veterinary medical officer at CVM, "The most serious reaction we saw in laboratory and field testing was ulceration of the scrotum at the injection site, associated with incorrect injection technique, movement of the needle during injection or the dog licking or biting the area after injection." To help educate veterinarians and dog owners about these and other safety issues and to prevent the occurrence of serious adverse events, the approved labeling includes an instructional videotape demonstrating the proper injection technique, and a client information sheet explaining the importance of postinjection monitoring and care.

Unlike surgical castration, dogs treated with Neutersol become sterile without removal of the testicles and, therefore, testosterone is not completely eliminated. Veterinarians and dog owners should be aware that diseases which occur as a result of or in conjunction with testosterone hormones (prostatic disease, testicular or perianal tumors) may not be prevented with this procedure. As with surgical castration, secondary male characteristics (roaming, marking, aggression, or mounting) may be displayed. Neutersol is manufactured by Meridian Medical Technologies, Inc. for Technology Transfer, Inc., Columbia, MO

and is available for use only by or on the order of a licensed veterinarian.

Rabies Confirmed in a Pet Guinea Pig

Adapted from Veterinary Quarterly Review College of Veterinary Medicine, Oct-Dec 2003

Although the incidence of rabies in small rodents is almost nonexistent and the vast majority of pocket pet bites are by animals that have not been outside and have virtually no potential to become exposed to rabies, the following case of one confirmed rabid guinea pig breaks this rule.

This case is not reported to instill undue concern for parents, pocket pet owners, animal control officers, veterinarians, physicians or others who deal with animal bites and the decision to submit biting animals for testing or the decision as to whether to administer postexposure treatment (PEP) to bite victims. Instead, it is to remind us all that every bite case should be evaluated based on its own merits and facts.

The New York State Department of Healths' Wadsworth Center Rabies Laboratory recently identified a pet guinea pig infected with raccoon variant rabies. This is the first rabid guinea pig and the first rabid pet rodent identified in the state. The animal was 6 years old and had been a pet with one family its entire life.

On Sept. 27, 2003, the owner brought the animal outdoors for fresh air and allowed it to roam free. The owner heard the guinea pig squeal and came around a dog house to see a raccoon running off to climb a tree. The guinea pig had burrowed under the edge of the dog house.

For the next few days, the animal favored a hind limb, though the owner did not report a visible wound. Later a raccoon was found dead, hit by a car on the road in front of the owner's home (not tested for rabies).

On Oct. 23, 2003, the owner was bitten by the guinea pig on bare skin – near the clavicle- and promptly washed the area twice with soap and water. She assumed she was bitten because she was squeezing the animal too hard. After thinking about the bite incident for several days, the owner contacted local health authorities and was advised to submit the animal for rabies testing.

The animal was euthanized Oct. 30, 2003. The veterinary technician who euthanized the animal noted that it had a poor hair coat and was a bit thin, with slightly crusty eyes from an ocular discharge, but nothing seemed out of the ordinary for an older guinea pig.

In hindsight, the owner reported that the guinea pig had become coprophagic in the week before euthanasia. The animal was not seen by a veterinarian. The brain tested strongly positive for rabies infection by immunoflourescence microscopy. This finding was confirmed by virus isolation in cell culture. Testing to evaluate virus tropism is pending.

Given the history, if the owner had not happened to witness the raccoon attack, the guinea pig may never have been tested and the patient may never have thought to contact local health at all.

In addition, guinea pigs often nip their owners, and guinea pigs usually die at home with nonspecific signs such as this one, without the owners contacting local health departments for rabies testing. If the owner had subsequently developed rabies, the guinea pig bite and the raccoon incident may never have been included in her patient history.

This case has many similarities to some of the incidents of rabid pet rabbits that have occurred in New York State. In several of those cases, the rabbits were caged outside. In one case a raccoon was observed nearby or on the cage, with a small wound noted on the rabbit. These rabbits usually were not properly confined for quarantine for 6 months and human exposure occurred when the rabbits developed clinical signs of rabies.

This guinea pig and the pet rabbit cases serve as a warning about the risks of letting unvaccinated pets, especially small rodents/rabbits that people don't think about in regard to rabies, outside without the protection of double cages. It also points out the

Christian Veterinary Mission • 19303 Fremont Ave. N., Seattle, WA 98133
Phone: (206) 546-7569 • Fax: (206) 546-7548 • Email: info@cvmusa.org Website: www.cvmusa.org

importance of reporting all potential contacts of those animals with wildlife to health departments for appropriate follow-up.

Where There Is No Refrigeration

Adapted from ECHO Development Notes Oct 2005 Issue 89

Editors Note: While the following article does not directly deal with animal health, we thought it might stimulate thought on applications for veterinary care in areas where the capacity for refrigeration is limited.

Several years ago, Mohammed Bah Abba designed an earthenware cooling system (the "pot-in-pot" method) to preserve foods in countries with hot, dry climates. In Northern Nigeria (where Abba is from), no electricity is available and propane refrigeration is prohibitively expensive.

Abba's design includes two clay pots of different sizes, one inside the other. Sand is put in the space between the pots and is kept wet. As the water evaporates toward the outside of the large pot (and toward the dry outside air), the contents of the inside pot are cooled and preserved for days. Evaporation requires energy, which is taken from the heat in the pot. As a result, the temperature drops and the inner container is cooled. The inner pot is covered with a damp cloth and the whole thing is kept in a very dry, ventilated place.

In trials, eggplants stayed fresh for 27 days (compared to three days otherwise); tomatoes and peppers lasted 21 days. African spinach was still edible after 12 days instead of spoiling after one day.

Abba hired unemployed pot makers to produce his cooling systems. He estimates that in Jigawa State, Nigeria, ¾ of rural families us the "Pot-in-pot" system.

The social and economic impacts of the Pot-in-pot technology are enormous. Farmers are now able to sell vegetables on demand instead of immediately after harvest. Married women can sell food from their homes. Girls are able to attend school instead of selling food every day. The whole community experiences less disease from eating spoiled food. Read more about Abba's invention in *Food Chain*, issue 29 (online at http://www.itdg.org/?id=food_chain).

Website Resources:

The Drost Project – An online collection of veterinary images made available for teaching purposes: http://www.drostproject.vetmed.ufl.edu/

Zoonotic Parasites in Dogs & Cats – Provides information on 10 common internal and external parasites of dogs and cats: www.petsandparasites.org

Canine Influenza – Extremely informative reports and briefings on canine influenza:

- http://www.cdc.gov/od/oc/media/transcripts/t050926.htm
- "Canine Influenza" links at: http://www.aahanet.org