Disease of Wild Felines II

Glomerulosclerosis

- Is a primary renal disease of captive Cheetahs
- Typical lesions of glomerulonephritis such as mesangial cell proliferation and synechia formation were not noted, suggesting that glomerulosclerosis in cheetahs was not immune-mediated as it is in domestic cats.
- Adrenocortical hyperplasia also was prevalent in the surveyed cheetah population, leading to the hypothesis that adrenal and renal lesions are associated in cheetahs.
- Glomerulosclerosis only rarely occurs in other species of wild felids

Glomerulosclerosis

- Histologically, glomerular basement membrane thickening was global, and glomeruli with thickened membranes were randomly interspersed with sclerotic glomeruli.
- The obsolescent glomeruli were composed of membranous silhouettes of glomerular tufts with diffuse homogeneous basement membrane thickening and without epithelial or endothelial cells.
- Similar thickening was present in the basement membranes of Bowman's capsules and surrounding some, but not all, tubules.
- More severely affected tubules had mildly dilated lumens with epithelial attenuation, progressing to epithelial atrophy with preservation of thickened basement membranes.

Parvoviruses

- Single stranded DNA viruses, naturally infect a wide range of carnivores including Felidae.
- The host range of the feline subgroup is poorly defined but felids are considered susceptible to both feline panleukopenia virus (FPL) and canine parvovirus 2 (CPV 2) variants.
- In cats, the diseases caused by CPV generally appear to be much milder than those seen in dogs infected with the virus, or those caused by FPV

Parvoviruses

- The finding shows that these parvoviruses can readily infect and cause disease in cats, through transfer from dogs, although cat-to-cat transfer is also possible
- **Clinical signs** and pathological lesions are rarely documented in wild felids.

- Differing outcomes depend on the timing of infection and may include:
- reduced litter size,
- severe lymphoid depletion with or without typical cerebellar or intestinal lesions, or
- classical lymphoid and intestinal disease in older cats characterized by intestinal hemorrhage, villous atrophy and collapse, necrosis and regeneration of crypt epithelium and opportunistic bacterial catarrhal to necrohemorrhagic enteritis.

- Viral inclusions in the intestine and shedding are more common early in the course of disease, which facilitates diagnosis by fecal electron microscopy, immunohistochemistry or virus isolation. Disease caused by CPV in felids may be milder than that caused by FPL.

Canine distemper virus (CDV)

- Has become a significant disease concern for captive and wild felids
- Felids were thought to be mostly resistant to CDV until a series of fatal infections occurred in captive tigers, lions, leopards, and jaguars living in zoological parks
- CDV infection is not universally fatal in felids. There is serologic evidence of CDV infection in wild felids throughout their natural habitats worldwide, including in South America, where fatal cases have not (yet) been reported

- CDV lesions in felids are similar to those in other carnivores including bronchointerstitial pneumonia and non-suppurative encephalitis with slight variations in manifestation that may be due to viral strain, tropism and pathogenicity.
- Co-infections may also be important in the outcome of viral infection, although they are not required for fatal infection.

Feline immunodeficiency virus (FIV)

- Feline immunodeficiency virus (FIV), a feline lentivirus related to HIV, causes immune dysfunction in domestic and wild cats.
- The Pallas' cat is the only species from Asia known to harbor a species-specific strain of FIV designated FIV_{Oma} in natural populations

- FIV is endemic, in African cat species and in species of Hyaenidae and infects nearly all South American felid species. Within populations in the wild, seroprevalence is highest in African felids (68-74%), lower in South American felids (5-28%) and nearly absent in Asia and Europe. Free-ranging Pallas' cats are the only known species from Asia that have a species-specific strain of FIV

- Monophyly of FIV proviral sequence within distinct Felidae species suggests that FIV transfer between cat species is an *infrequent* event

- FIV causes immune dysfunction in domestic cats, resulting in **depletion of CD4+ cells**, increased *susceptibility to opportunistic infections*, and sometimes death

Bluetongue

- (BT) virus serotype 8 has been associated with disease in captive Eurasian lynx fed stillborn or aborted fetuses from farms with confirmed BT infection

Bluetongue

- The 2 Eurasian lynx, held in the same cage in a zoo in Belgium, became *lethargic* in September 2007; animal 1 *died* after 2 days, and animal 2 died in February 2008.
- Both **had been fed ruminant fetuses and stillborns** from surrounding farms in an area where many bluetongue cases had been confirmed.

Bluetongue

- Necropsy findings for animal 1 were *anemia, subcutaneous hematomas, petechial hemorrhages, and lung congestion with edema.*
- Necropsy findings for animal 2 were *emaciation, anemia, enlarged and gelatinous lymph nodes, petechial hemorrhages, and pneumonia.*
- For each animal, microscopic examination showed *edematous vascular walls; enlarged endothelial cells; and evidence of acute to subacute vasculitis in muscle, myocardium, peritoneum, and lung*
- BTV RNA was found in all samples from animal 1

Bluetongue

- Accumulating evidence suggests that carnivores can also be infected by bluetongue virus. Antibodies to this virus have been detected in dogs, cats, cheetahs (Acinonyx jubutus), lions (Panthera leo), wild dogs (Lycaon pictus), jackals (Canis spp.) spotted hyenas (Crocuta crocuta) and large-spotted genets (Genetta maculata). Clinical signs have been reported in pregnant dogs infected by serotype 11, and nonpregnant Eurasian lynx (Lynx lynx) infected by serotype 8.

Spongiform encephalopathy

- Several captive cheetah in Europe developed spongiform encephalopathy with vacuolation in the neuropil and neurons of the midbrain, thalamus and hypothalamus
- Feline spongiform encephalopathy (FSE) is a transmissible spongiform encephalopathy that affects domestic cats (Felis catus) and captive wild members of the family Felidae
- The biochemical examination revealed a BSE-like pattern. Disease-associated scrapie prion protein (PrPSc) was widely distributed in the central and peripheral nervous system, as well as in the lymphoreticular system and in other tissues of the affected animal

- Mycobacterium bovis (bTB)
- Salmonellosis
- Feline calicivirus
- Feline Infectious Peritonitis (FCoV)
- …..