

VETERINARY PEDIATRICS: PUPPY AND KITTEN DISEASES

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PEDIATRIC DISEASE

- Bacterial
- Viral
- Fungal
- Parasitic

Bacterial Diseases

- Frequent disorder of neonates
- Sepsis occurs when bacterial infections overcome the newborn's immune system's ability to provide adequate protection
 - invasions that in healthy adults would rarely be of any consequence

Signs of septicemia

- Acute death
- Failure to gain
- Respiratory difficulties
- Cyanosis
- Hematuria
- Vocalization
- Sloughing of extremities

Organisms in Septicemia

- Klebsella
- Staph
- E. coli
- Beta hemolytic Strep
- Enterococcus
- Clostridium
- Bacteroides

Portals of Entry

- Gastrointestinal (gut permeable)
- Peritoneum
- Respiratory Tract
 - most begin in oropharynx
- Skin and associated wounds
- Urinary tract

Factors influencing outcome

- Host Factors
 - defects of the immune system
 - maternal immunity
 - inadequate colostrum
 - age at time of exposure
 - maternal antibodies low at 6-8 weeks
 - immune system begins to function at 4 weeks

Factors influencing outcome

- Host Factors
 - multiple illness
 - nutritional status
 - prematurity or dystocia
 - mastitis or metritis of the bitch or queen
 - improper commercial formula feeding
 - hypothermia

Factors influencing outcome

- Environmental Factors
 - number of animals in environment/crowding
 - temperature and humidity
 - sanitation
 - interchange of animals from one population to another
 - Stress

Septicemia Treatment

- Take culture
- Treat empirically and quickly!
 - immune serum
 - antibiotics (IV or IO)
 - Warmth
 - O₂
 - Fluids/glucose
 - Vitamin k

Antimicrobial Choice

- Avoid toxicity
- Efficacy against organism involved
- Use IV or IO route
- Oral routes may not give effective blood levels
 - do NOT expect antimicrobials given to dam to be sufficient - only 1-2% reach young
 - milk may inhibit absorption

Antimicrobial Choice

- Empiric choice
- Begin immediately
- minimize negative impact on gut flora

Antimicrobials

- Penicillins
 - Amoxicillin good first choice
 - low toxicity
 - sensitive to beta-lactamase enzymes
 - New penicillins may be better ie. Ticarcillin, Carbenicillin - better gram negative activity
 - Reduce dose in renal failure

Antimicrobials

- Beta-lactamase inhibitors
 - Clavamox good against E.coli, Klebsiella, sometimes Proteus
 - Use lower dose first week of life
 - Ampicillin/Sulbactam good against Pasturella

Antimicrobials

- Quinolones
 - broad spectrum, but limited against Strep and anaerobes
 - can cause cartilage defects in young

Antimicrobials

- Aminoglycosides
 - nephrotoxic- caution
- Potentiated Sulfonamides
 - do not use in neonates, modify dose in 4-16 wk
 - adverse effects - allergic immune complex
- Tetracyclines
 - Stains teeth
 - Use cautiously in face of renal failure & septicemia

Antimicrobials

- Cephalosporins
 - Generally good choice
 - Do not use if azotemic
 - Puppies - same dose, but increase interval
 - Kittens - decrease dose by 30-50%

Antimicrobials

- Cephalosporins
 - First generation best against gram positive
 - Second generation more active against gm-
 - Third generation reserved for resistant gram neg. and most anaerobic bacteria
 - Good first choice for severely septicemic
 - Can achieve therapeutic CSF levels

Group G Streptococcal Disease in kittens

- Neonates affected through vaginal contamination of queen
- Primarily in young queens
- Can be carried on male genitals
- Neonates affected gain less than littermates
- Death usually 7-11 days

Group G Streptococcal Disease in kittens

- Can develop fever
- May have swollen umbilicus
- Neutrophilia and left shift
- May have respiratory distress
- May be found dead

Ophthalmia Neonatorum

- May see before eyes open
- Swollen lids
- Crusty discharge
- Treatment
 - separate lids
 - apply antibiotic ophthalmic ointment

Bordetella bronchiseptica

- Problem in both kittens and puppies
- Can cause pneumonia and death in young
- Vaccines available for both species

Viral Diseases of Puppies

- Herpes virus
- Canine Parvovirus
- Adenovirus
- Canine Parainfluenza virus
- Canine Corona Virus
- Minute virus

Canine Herpes virus

- virus only affects canidae
- intracellular
- lifelong latent infections
- obtained in utero or through vaginal passage or contact with infected dogs

Canine Herpes Virus

- Mild or inapparent respiratory disease in dogs over 3-5 weeks old
- Transplacental infections can occur in mid to late gestation
 - mummified fetuses
 - premature or stillborn pups
 - weak or runted newborns

Canine Herpes Virus

- Neonatal puppies very susceptible
 - dull/ depressed
 - cry/restless/painful
 - anorexic/weight loss
 - petechial hemorrhages of mucous membranes
 - hypothermia
 - seizures
 - death

Canine Herpes Virus

- Gross lesions
 - multifocal hemorrhage
 - fibrinoid necrosis
 - perivascular necrosis of lung, liver, kidney, spleen, small intestine, and brain

Canine Herpes Virus

- Serologic tests based on viral neutralizing
- Antibodies remain high for only 2 months
- Low titers may be detected for 2 years
- Seropositivity only indicates exposure, not necessarily active infection

Canine Herpes Virus

- Treatment
 - often unrewarding - rapidly fatal
 - IP immune sera
 - elevate environmental temperature
- Residual damage may be complication for survivors

Canine Herpes Virus

- Prevention
 - low frequency makes little incentive for vaccine manufacturers (about 6% with antibodies, but can be very high in some kennels)
 - subsequent litters from affected bitch have low risk for disease
 - keep environmental temperature warm
 - sanitation, avoid exposure to show dogs, carriers

Minute Virus of Canines

- First isolated in 1967 in military dogs
- Canine parvovirus 1- serologically different from CPV-2
- Domestic dog only proven host
- Widespread
- Clinical disease in pups less than 3 weeks

Minute Virus of Canines

- Oral exposure - probably from feces
- Usually seen in pups 5-21 days old
- Mild or vague signs
 - diarrhea
 - vomiting
 - dyspnea
- Progresses to death

Minute Virus of Canines

- Pathology
 - thymic edema and atrophy
 - enlarged lymph nodes
 - soft stool
 - irregular areas in the myocardium
 - intestinal changes

Minute Virus of Canines

- Treatment - supportive care
- No vaccine available

Kennel Management

- Avoid crowding
- Isolate new arrivals at least 10 days, deworm and vaccinate
- Strict sanitation:
- Avoid inbreeding or using stock with poor immune function
- Plan kennel airflow carefully

Kennel Management

- Monitor temperature and humidity
- Avoid fomite transmission
- Necropsy dead puppies
- Individualize programs

Kitten Viral Diseases

- FeLV
- Feline panleukopenia
- Feline viral rhinotracheitis
- Feline calicivirus
- FIP
- FIV
- Feline enteric corona virus

Kitten Viral Diseases

- Feline Enteric Corona Virus
 - vomiting
 - diarrhea
 - usually transient and mild
 - may mutate and cause FIP

Feline Enteric Corona Virus

- Keep litters separate
- Wean young of positive queen early and separate
- Sanitation

Cattery Management

- Virus carriers common
- Incomplete immunity from FHV and FCV vaccination
- Panleukopenia has strong environmental persistence
- Latent virus

Cattery Management

- Environmental management
 - disinfection
 - monitor temperature and humidity
 - avoid crowding
- Isolate new arrivals at least 4 weeks
 - test
 - deworm
 - vaccinate

Cattery Management

- Strict sanitation - hands, clothing, shoes, dishes
- Advise against inbreeding
- Individualize programs
- Highest risk of infections at weaning
 - remove from infected queen at 4 weeks
 - beware of socialization problems if hand raised
 - kittens “under foot” at most risk

Parasites

- Hookworms
- Ascarids
- Giardia
- Whipworms
- Toxoplasmosis
- Coccidia
- Tapeworms

Anthelmintics

- Pyrantel (Nemex)
 - good for very young
 - low toxicity
 - low cost
- Fenbendazole
 - very broad spectrum
 - can use in pregnant bitches

Parasites

- Neospora caninum
 - worldwide
 - congenital and possibly fecal-oral transmission
 - seropositive rate less than 20%
 - in many different species
 - dogs
 - horses
 - goats
 - possibly cats

Anthelmintics

- Praziquantel (Droncit)
- Cestex
- Combinations
 - control with some heartworm products
- Need to consider parasite lifecycle
- Hygiene critical

Neospora caninum

- Clinical findings
 - ascending paralysis
 - rigid contraction
 - hyperesthesia
 - dysphagia.
 - Early fetal death

Neospora caninum

- Diagnosis is difficult
- Increased AST if muscles involved
- If liver inflamed - increased ALT, ALP
- Sometimes CSF within normal limits
- May find in CSF or tissue aspirates or biopsy

Neospora caninum

- Pathology
 - multifocal streaks of necrosis, fibrosis
 - hepatomegaly
 - pneumonia
 - encephalomyelitis
 - tissue cysts

Neospora caninum

- Therapy
 - clindamycin
 - trimethoprim
 - sulfadiazine
- No improvement if advancing paralysis
- No known prevention of spread from bitch to puppies
- Avoid using infected dams

The End

- Read Greene's Infectious Diseases of the Dog and Cat great resource!