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Neonatal Mortality

("Fading Syndrome" in Newborn Puppies or Kittens)

Basics

OVERVIEW

- Death occurring from birth to 2 weeks of age
- "Neonatal" is defined as the period immediately following birth and up to the first 14 days following birth
- "Mortality" is defined as death

GENETICS

- Inbreeding—higher incidence of having identical recessive genes in the genetic make-up of an individual (known as a "homozygous recessive genotype")

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs
- Cats

Breed Predilections

- Purebred or pedigree puppies and kittens—more prone to congenital (and hereditary) defects; congenital defects are conditions present at birth; they may or may not be inherited

Mean Age and Range

- Birth–2 weeks of age

SIGNS/OBSERVED CHANGES IN THE PET

- Preweaning losses—typically 10–30% of the litter; about 65% of these losses occur during the first week of life; greater losses in a cattery or kennel should be considered abnormal
- Historical and physical examination findings rarely help determine the diagnosis, because of the limited number of ways newborns (neonates) can respond to illness
- Low birth weight, loss of weight, and/or failure to gain weight
- Decreased activity and appetite
- Weakness
- Constantly vocal or restless early, quiet and inactive later
- Tendency to remain separate from the dam and the rest of the litter

- Low body temperature (known as “hypothermia”)—normal newborn body temperature is about 35.5°C (96°F), rising to 37–37.8°C (99–100°F) during the fourth week of life; low blood-glucose levels in the blood (known as “hypoglycemia”); dehydration—common and often inter-related
- Breathing difficulties (known as “respiratory distress”), diarrhea, or dark colored urine due to the presence of hemoglobin (known as “hemoglobinuria”; hemoglobin is a breakdown product of red-blood cells)—may be seen
- Gross anatomic defects—may be detectable

CAUSES

Non-infectious

- Dam-related—difficult birth (known as “dystocia”) or prolonged labor; cannibalism; failure to produce milk (lactation failure); trauma; inattention or over attention to newborn; inadequate nutrition, including taurine deficiency in kittens (taurine is a necessary amino acid)
- Environmental—any factor that discourages nursing and allows low body temperature (hypothermia), including temperature extremes, humidity extremes, inadequate sanitation, overcrowding, and stress
- Nutritional—inadequate or ineffective nursing; low blood-glucose levels (hypoglycemia); low body temperature (hypothermia)-induced digestive malfunction
- Breakdown of red-blood cells due to the presence of antibodies from the mother in the milk (condition known as “neonatal isoerythrolysis”)—queen (mother cat) with blood type B; kitten with blood type A
- Birth defects
- Gross anatomic defects—more frequently in kittens (about 10% of non-surviving newborn kittens) than in puppies
- Gastrointestinal abnormalities—congenital (present at birth) opening in the palate (known as “cleft palate”); lack of formation of a section of the intestine (known as “segmental intestinal agenesis”) or lack of development of normal tubular opening of the intestines (known as “intestinal atresia”)
- Abnormalities of the head and/or face (known as “craniofacial abnormalities”)—failure of midline closure, causing herniation
- Heart defects—valvular dysplasia; ventricular septal defect; atrioventricular fistula
- Respiratory defects—chest wall abnormalities; depression of the sternum and chest (known as “pectus excavatum”); inherited defect leading to lack of removal of respiratory secretions (known as “primary ciliary dyskinesia”); surfactant deficiency
- Inborn errors of metabolism—usually autosomal recessive traits

Infectious

- Viral (puppies)—canine adenovirus type 1; canine distemper virus; canine herpesvirus; canine parvovirus type 1; canine influenza virus
- Viral (kittens)—feline calicivirus; feline leukemia virus (FeLV); feline immunodeficiency virus (FIV); feline herpesvirus type 1, feline panleukopenia virus
- Bacterial—exposure to infectious bacteria mainly across the placenta, in the birth canal, via the umbilicus, gastrointestinal tract, respiratory tract, urinary tract, or skin wounds
- Generalized bacterial infection of the newborn (known as “neonatal sepsis”)—primarily from *E. coli*, β-hemolytic *streptococcus*, coagulase-positive *staphylococcus*, and gram-negative enteric organisms
- Respiratory—*Bordetella bronchiseptica*, *Pasteurella multocida*
- Gastrointestinal tract—*E. coli*; *Salmonella*; *Campylobacter*
- *Brucella canis*—puppies
- Parasitic infection—heavy infection with intestinal worms (such as *Toxocara canis*, *Toxocara cati*, *Toxascaris leonina*, *Ancylostoma caninum*, or *Ancylostoma tubaeforme*); coccidian parasites (such as *Toxoplasma*, *Neospora, Isospora*, *Cryptosporidium*, or *Giardia*)

RISK FACTORS

- Subnormal birth weight or failure to grow normally—kittens: minimum daily gain of 7–10 grams; puppies: should double in weight by 10–12 days; both: 5–10% gain per day generally acceptable
- Difficult birth (known as “dystocia”) or prolonged labor
- Inbreeding— higher incidence of having identical recessive genes in the genetic make-up of an individual (homozygous recessive genotype)

- Sire with blood type A and queen (mother cat) with blood type B (cats)

Treatment

HEALTH CARE

- Correct any underlying deficiencies in husbandry or breeding selection
- Warmth—slowly warm newborn (neonate) to 36–36.7°C (97–98°F) over several hours, if necessary; provide ambient temperature of 29–35°C (85–95°F) and relative humidity of 55–65%
- Oxygen—supplement at 30–40%, if necessary
- Intravenous fluids—consider administration of warmed dextrose in water (D5W) solution if newborn has low blood-glucose levels (hypoglycemia); administer warm lactated Ringer's solution or half-strength lactated Ringer's and D2.5W (may be administered into a vein [intravenously], into a bone/bone marrow [intraosseously], or under the skin [subcutaneously])
- Do not attempt to feed if body temperature less than 35°C (95°F) and newborn has no sucking reflex; once warmed, encourage nursing
- Breakdown of red-blood cells (neonatal isoerythrolysis) due to the presence of antibodies from the mother cat in the milk—do not allow nursing for first 24 hours after birth

Medications

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive

- Antibiotics—commonly used are penicillins (penicillin G, ampicillin, amoxicillin, amoxicillin with clavulanic acid) and first-generation cephalosporins
- Supplement—milk-replacer formula
- Vitamin K1

Follow-Up Care

PATIENT MONITORING

- Hydration status—check daily; dryness of mouth and yellow golden urine indicate dehydration
- Body weight—monitor daily or every other day in growing newborns (neonates)
- Dam—check that nursing and care are adequate; supplement nursing with milk-replacer formula, if necessary

PREVENTIONS AND AVOIDANCE

- Breakdown of red-blood cells (neonatal isoerythrolysis) due to the presence of antibodies from the queen (mother cat) in the milk—do not allow nursing for first 24 hours after birth

Key Points

- Death occurring from birth–2 weeks of age
- Purebred or pedigree puppies and kittens—more prone to congenital (and hereditary) defects; congenital defects are conditions present at birth; they may or may not be inherited
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Notes

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