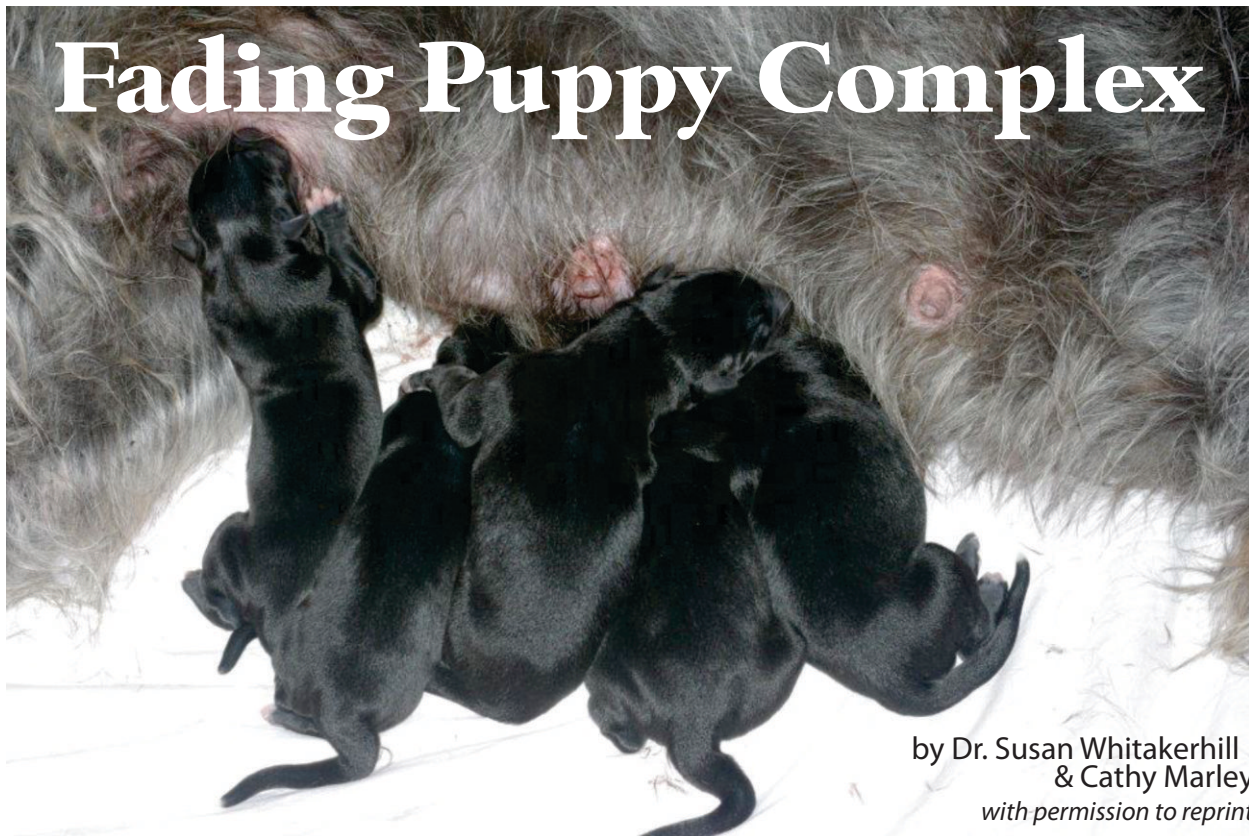




by Dr. Susan Whitakerhill
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Neonatal mortality in puppies

- 9.23 to 26% of all whelps
- 50% of these deaths attributed to fading puppy complex
- Little research has been done on the subject

Causes of neonatal mortality — (Fox, 1961)

Infection

- Canine hepatitis virus
- Staph, Strep
- E coli
- Proteus
- Staph or strep toxin
- Parasites

Genetics

- Congenital defects
- inbred litters have higher mortality than hybrid crosses of inbred litters - Fox 1963

Environment

- Temperature: Hypothermia or hyperthermia
- Toxins: cleaning fluid fumes, etc

Nutrition

- In utero
- Failure of lactation
- lack of attention of dam
- Low birth weight/immaturity
- Icterus neonatorum

Definition of fading puppy complex

- Apparently normal newborn, which fails to thrive and dies in the first 2 weeks of life

Signs of fading puppy complex

- Failure to gain weight at same rate of siblings
- Decreased activity
- Inability or refusal to suckle

- High pitched cry

- Progression to lethargy, loss of tone, death

Case Study – Dex

August 24

- 2nd in birth order • Normal birth weight • No difficulty whelping
- Nursed well

August 29

Failure to gain weight – 295 grams

- 12:00 PM – Crying, refuses to suckle. Treated with warming, pedialyte via feeding tube every two hours
- 6:00 PM – High pitched cry, increasing lethargy, abdominal breathing, sternal retractions
- 10:00 PM – In respiratory distress, retracting, lethargic. Administered 0.16 mg (0.6 mg/kg) of dexamethasone SQ

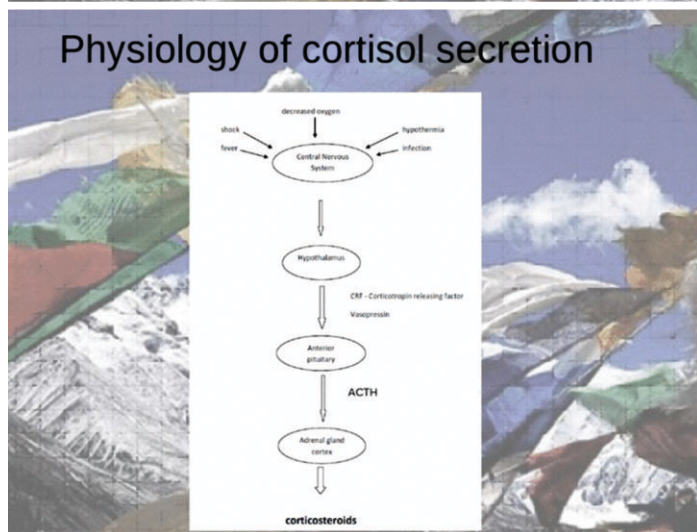
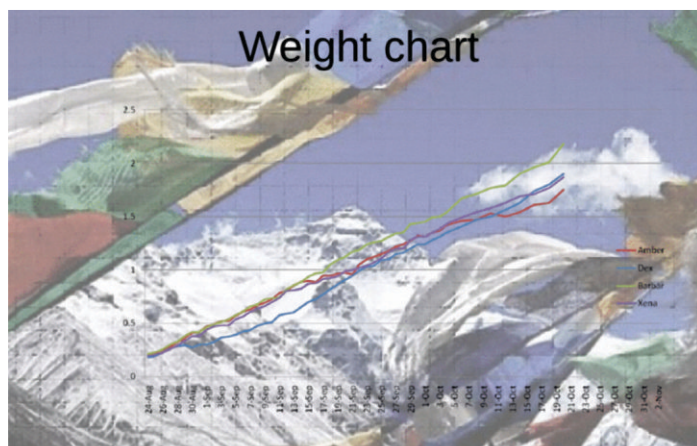
August 30

- 4:00 AM - lusty crying, suckled when placed on breast. Calmed by nursing. Milk confirmed in stomach via oral gastric tube
- 7:00 AM nursing strongly, abdomen expanded after feeding. Weight 272 grams
- 12:00 PM back with litter, competing for teats successfully.

August 31

- 7:00 AM – Weight 301 grams
- 12:00 PM – not nursing as well
- 4:00 PM – 36 hours after dexamethasone dose, no longer nursing, crying constantly.
- Administered 0.16 mg dexamethasone SQ.
- 10:00 PM – once again nursing well, having trouble competing. Nursed with one other sibling.

- **September 1**
- Weight 301 grams
- Back to normal by 7:00 AM
- Placed on decreasing dexamethasone doses daily for the next 10 days
- Continued to gain weight at an accelerated rate until he caught up with littermates.



Cortisol Functions

- Increases blood sugar
- Stabilizes cell membranes
- Decreases the inflammatory response

The physiology of immaturity

- Effects of anoxia take longer to appear in the brain of the neonate than older puppies (Mott, 1961)

Best and Taylor 1951

- Older dogs exposed to cold increase the secretion of cortisol, neonatal puppies do not
- Also found a lack of compensatory vasoconstriction on re-warming neonates.

Randall et al 1995

- Study of beagle puppies found 2-week-old puppies have lower cortisol than adults, but do respond to Adrenocorticotrophic hormone (ACTH) administration

Cowan 1975

- Histamine injected into 1-7 day old puppies causes lower secretion and peak rates of cortisol secretion than adults.

Bardens et Al 1961

- Puppies have low glycogen reserve

- With stress can develop a metabolic derangement of glycogen metabolism, which appears to be similar to Von Gierkes syndrome
- Glycogenosis precipitated by stress was alleviated with administration of glucose and corticosteroids

Adrenal crisis in humans

- Shock, progressive lethargy, vomiting, death
- Treatment is administration of hydrocortisone, IV fluids
- Recovery with treatment is rapid

Dexamethasone

- Trade names: Azium, Decadron
- Classification: glucocorticosteroid
- Onset of action: 4-8 hours Duration of action: 24-72 hours
- Injectable formulation is also absorbed orally
- Can be given SQ, IM, IV or orally

Question: Is fading puppy complex an adrenal crisis in the neonate who is physiologically unable to respond to a stressor?

— Caveat: there are some stressors that are not survivable for example overwhelming infection, severe congenital defects.

Supportive treatment for the fading puppy

- Warming
- Oral or IV glucose
- Rehydration
- Reversal of the underlying stress or cause
- Dexamethasone administered early if warming, glucose and hydration do not have any effect.

Dexamethasone

- **Dosing:** Initial dose 0.6 mg/kg of body weight subcutaneously.

(We are using 0.6mg/kg on the first dose, followed in 36 hours with a second dose of 0.6 mg per kg. That is very tiny doses for Lhasa puppies! Should be easier to dose for Irish wolfhounds!)

- Drug vial is 4 mg/ml for precise dosing must dilute to 1 mg/ml. This is 0.25 cc in 0.75 cc of saline.
- Use a U100 cc insulin syringe this is divided up into 0.01 cc increments.
- Decrease the daily dose by 0.05 mg/kg every day until the puppy is off the medicine. As long as the puppy is doing well, after the first dose the remainder can be given orally.

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