VIRGINIA COOPERATIVE EXTENSION SERVICE

EXTENSION DIVISION - VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY - BLACKSBURG, VIRGINIA 24061

VIRGINIA-MARYLAND
REGIONAL COLLEGE
OF
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# VIRGINIA VETERINARY NOTES



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WHAT'S INSIDE!



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## THE ROLE OF ATROPINE IN CANINE ANESTHESIA

Atropine is frequently given before anesthesia to prevent the alleged vagal-stimulating (or vagomimetic) effects of certain anesthetic agents and surgical procedures. The most serious effects of vagomimesis, which atropine prevents, are bradycardia, bradyarrhythmias, bronchosecretion and bronchoconstriction. Evidence that Atropine may cause more problems than it solves is accumulating; most importantly it increases the risk of ventricular dysrhythmias during induction with thiobarbiturates. As Atropine increases the anatomic dead space and the metabolic rate, it predisposes the patient to tissue hypoxia. The drug prolongs recovery from anesthesia and excitement is more likely at this time. At Virginia Tech, we withhold Atropine until its use is positively indicated. As a result, we are identifying those clinical situations in which routine administration is justified and those in which it is not.

Xylazine (Rompun-Bayvet) and fentanyl-droperidol (Innovar-Vet - Pitman-Moore) are consistently vagomimetic in dogs. High doses of Morphine (greater than 0.5 mg/kg) and acetylpromazine (greater than 0.1 mg/kg) may also cause vagal slowing of the heart, especially in the brachycephalic breeds. Routine administration of atropine at 0.04 mg/kg IM is probably justified when these drugs are used. Of the inhalation agents, Methoxyflurane (Metofane - Pitman-Moore) is more likely to cause bradycardia (when compared with halothane). This is more likely at deep levels of anesthesia, following prolonged administration and when the patient is hypothermic. If bradycardia or bradyarrhythmias are encountered, it is initially preferable to lighten the level of anesthesia and attempt rewarming. Only when these are ineffectual should atropine be given at 0.04 mg/kg IV.

Ocular, auricular, laryngeal, tracheal and visceral surgery are alleged to cause vagally-mediated problems in the dog, but we have seen no evidence of this. However, direct, inadvertent surgical traction of the cervical, thoracic or abdominal vagi will cause vagomimesis, and when surgery runs this risk, we advocate that Atropine is drawn up beforehand at 0.04 mg/kg. If patient monitoring indicates that vagal effects are developing, this dose is given IV and surgery suspended for the 90-180 seconds it takes for vagolysis to occur. Surgery may then be resumed.

The use of Atropine is frequently justified on the grounds that it prevents the accumulation of oropharyngeal secretions that may threaten airway patency. it should be appreciated, however, that modern inhalation agents do not stimulate secretions, and that a cuffed endotracheal tube is a better guarantee of airway patency. Moreover, glycopyrrolate (Robinul - A.H. Robins) at 0.01 mg/kg IM or IV is a proven, more potent and longer-acting anti-sialagogue than Atropine, and in situations where secretions are undesirable (such as oropharyngeal surgery) we consider it to be the drug of choice.

Since the risk of adverse drug interactions increases with the number of drugs given, the administration of each must be clearly justified in terms of safely achieving an end-result. To administer a drug, such as atropine, on the grounds that it has always been given, is probably the worst justification of all.--**R.E. Clutton and D.L.S. Richards, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA 24061.**

## STARVATION

Starvation is one of the most common causes of death among all animal species. The diagnosis is frequently missed, not because the characteristic lesions are difficult to find, but because it is a difficult diagnosis for the clinician and for the owner to accept.

The most striking lesion of starvation is an absolute lack of body fat. If the prosector has not done that many necropsies, the absence of fat may not be that obvious. The prosector should observe the marked prominence of organs such as the kidneys or the adrenal glands that normally should be well surrounded by adipose tissue or the prominence of vessels in the mesentery which are usually partially obscured by fat. Other sites in which the depletion of adipose tissue depots can be easily observed include the coronary groove, the omentum, and the subcutis. if a long bone is split and the marrow cavity examined, one observes that its contents has a gelatinous texture. This change, characteristic of starvation, is referred to as "serous atrophy of fat". Adipose tissue in the other locations mentioned may have a gelatinous consistency as well. The liver is frequently small and dark brown. Muscle tissue also appears slightly darker than normal.

The obvious reason for an animal to have starved is that enough food has not been provided. Although in some cases of starvation this may be true, it is not always as simple as that. Excessively or irregular worn teeth may be the cause of insufficient food intake, especially in older animals. A non-healing wound in the oral cavity, pharynx, or esophagus may also impair an animal's ingestion of food. These lesions are usually secondary to a foreign body or result from the improper use of a stomach tube or balling gun.

A few causes of starvation are especially common in calves or other ruminants. A newborn calf or lamb is not a fully "functional" ruminant until it is several months of age. Its rumen flora is not well developed. Because of this young calves and lambs cannot utilize hay, grass, and grain as can their adult counterparts. They will starve in spite of being given abundant amounts of these feeds. Another problem occurs with the use of powdered milk replacers. A calf can only consume a finite volume of liquid. The concentration of the milk replacer mixture must be considered. If too dilute, the calf will starve even though it is apparently consuming a sufficient volume of milk replacer. One should also remember that the animal's caloric intake should be increased in cold weather.

Animals that are in a weakened condition may terminally get diarrhea. Frequently this is what the owner and clinician observe and would therefore prefer to blame the animal's poor condition and death to an intestinal infection. Even though pathogenic organisms are not isolated from intestinal contents at necropsy it is still difficult to convince the owner and clinician that the real diagnosis is starvation.--**Lois Roth, DVM, PhD, Diplomate ACVP, Virginia-Maryland Regional College of Veterinary Medicine, Blacksburg, VA 24061.**

**Editor's Note:** This is the third of a series of articles on cats and their special pharmaceutical problems. These articles are taken from Veterinary Topics, University of Illinois, Vol 11, #1, 1986.

## ANTIBIOTICS

Controversy has long existed over the use of chloramphenicol in cats. The rare, idiosyncratic, nondose-related agranulocytosis and aplastic anemia seen in human patients has not been reported in the feline. However, cats are susceptible to the dose-dependent bone marrow depression and blood dyscrasias reported in other species because this drug is highly dependent on hepatic biotransformation for elimination from the body. Perhaps a more significant clinical consequence of chloramphenicol administration is anorexia. In an already debilitated patient, this may be life-threatening. Hence, it is desirable (if chloramphenicol must be used) that a minimum acceptable regime of therapy be employed with regard to both dosage and total duration of therapy. A dosage of 13 to 20 mg/kg orally B.I.D. (versus the recommended dose of 20 mg/kg T.I.D.) has been shown to produce therapeutically effective plasma chloramphenicol levels and may represent an acceptable treatment regime.

Streptomycin and dihydrostreptomycin may produce neurotoxic effects in cats. Respiratory failure due to neuromuscular blockage may be induced by high doses (150 mg/kg IV) of streptomycin. Repeated smaller doses (50 mg/kg) given IM produce ataxia, gait and postural alterations, and disappearance of the normal rotational nystagmus; hearing is also reported to be affected. It should be noted that all aminoglycoside antibiotics (streptomycin, dihydrostreptomycin, kanamycin, neomycin, and gentamicin) have been shown to cause either vestibular lesions or renal tubular damage in dogs and cats when used for prolonged periods of time. Veterinarians should use this group of antibiotics cautiously in both species, particularly when any degree of renal impairment is present, for these drugs are eliminated by direct renal excretion.

## TREATMENT OF EXUBERANT GRANULATION TISSUE IN HORSES

In a recent study, healing time for bilateral, surgically-created granulating wounds was observed. Wounds treated by excision only or cryosurgery and then exposed to air did not produce exuberant granulation tissue that necessitated further excision. Wound treatments exposed to air healed in an average of 12 to 15 weeks versus healing time averages of 17 to 19 weeks for wound treatments of bandaging or plaster casting. Wounds treated with bandaging or casting also produced granulation tissue requiring excision by the 4th week, and weekly thereafter (or at cast changes), until healing was complete.

Exposing granulating wounds to air, with or without cryosurgery, inhibits granulation tissue production and promotes rapid healing. Plaster casts should be reserved for wounds that need granulation tissue to fill a defect, or have been sutured and need support or immobilization.--**Taken from Oregon Extension Veterinary Notes, May 1984. (Veterinary Professional Topics, Vol. 12, #3, 1986 University of Illinois).**

## NUTRITIONAL ALERT

We have recently had a lot of concern about the quality of corn available to horse owners in Virginia. Corn available to millers and compounders from the Mid-west has been subjected to conditions which were conducive to the development of fungal contamination, leading to aflatoxin production. Aflatoxins are primarily a hepatotoxin and are produced by the Aspergillus spp. of fungi.

A separate but recurring problem is that of Equine Leucoencephalomalacia, a condition brought about through horses consuming moldy corn, caused by Fusarium moniliforme, and known to the public as Moldy Corn Disease. Eight cases of ELEM have been reported in Maryland recently, with several suspect cases in the Chesapeake area of Virginia. All the cases have been caused by feeding locally grown corn. Since all reporting of ELEM to the State Veterinarian is voluntary, it could be that other cases of ELEM have occurred in the state.

Symptoms of ELEM include anorexia, depression, circling, head pressing, blindness, mania, convulsions and death. Necrosis of the white matter of the cerebrum is seen on autopsy. Morbidity rates are 10-30% while the mortality rates are 90-100%.

In view of this, veterinarians might wish to advise clients that they can substitute barley or oats in the ration for corn. if you need specific advice on changes in the nutrition of your client's horses, then please contact Dr. Craig Thatcher (703/961-6041). For toxicological details about aflatoxin contamination or ELEM contact Dr. Dennis Blodgett (703/961-7573) or Dr. Blair Meldrum (703/961-4669).--**J.M. Bowen, Equine Extension Veterinarian, Virginia-Maryland Regional College of Veterinary Medicine.**

## FEEDING THE NEONATAL KITTENS

Supplemental feeding of orphaned kittens can be a significant challenge, but some owners attempt the task and look for advice. Since the kitten has higher protein and carbohydrate requirements than puppies, commercial puppy supplements should not be used. Kitten milk replacers are available, but clients often are looking for less expensive alternatives. One such diet follows:

- Equal parts of evaporated skim milk and water (to make ½ cup of formula) or skim milk.
- Pinch of iodized salt.
- 1-minute whole egg without shell (never use raw egg whites).
- Vitamin/mineral supplement including B-complex vitamin and Vitamins A, E and D. Follow quantity directions for kittens.
- 1/8 teaspoon of bacon fat or butter.
- 1/8 teaspoon of honey, maple syrup, corn syrup or table sugar.

These diets should be fed at intervals of a few hours. Kittens 24-48 hours old usually consume 2-3 ml of milk per feeding. Abdominal distention and rejection of further milk are signs that kittens should be weighed on a gram scale daily for the first few weeks. A newborn kitten should weigh 100 grams plus or minus 10 grams and should double its weight weekly.

If a kitten develops diarrhea, a small quantity of powdered rice cereal with banana can be mixed with the formula.--**Jane Bicks, Iowa State University Veterinary Medical Extension Newsletter, Vol. 665, #318, December 1986.**

## "JAW DROP" SYNDROME IN DOGS

"Jaw drop" syndrome is a condition seen in dogs in which the lower jaw sags limply half open. It is produced by a bilateral motor paralysis of the mandibular branch of the trigeminal nerve. The most common cause is a neuritis (round cell infiltration) of the motor nerve root. The etiology is unknown but is suspected to be immune mediated. Trauma, such as jerking the mouth open, can produce the same clinical picture.

The syndrome appears to have a seasonal occurrence with most cases seen in October and November.

The onset of the condition is sudden and is generally painless. The animal can usually swallow and can eat if hand fed or if the food is in small pieces. Victims can drink if the bowl is deep enough. Rarely are other cranial motor nerves involved, but if the ninth and tenth are, then the animal has serious problems and may not survive.

"Jaw drop" dogs should have their jaws put in a muzzle to prevent the mouth from drying out. The muzzle can be removed at meal times. Corticosteroids may help, but most cases recover in 3-6 weeks without treatment. Rare cases do not recover and gradually develop involvement of the other brainstem motor nerves.

Rabies should always be considered in the differential diagnosis.--**by Allan Paul, DVM, MS, Small Animal Extension Veterinarian, and Alan Parker, DVM, MS, Professor of Veterinary Clinical Medicine, both at the University of Illinois College of Veterinary Medicine.**

## EFFECT OF VITAMIN E ON THE IMMUNE SYSTEM

Supplemental vitamin E enhanced immune responses of calves. When groups of 7 Holstein heifer calves 1 day old were given 2800 mg dl-alpha-tocopheryl acetate (Hoffman-LaRoche) PO or 1400 mg dl-alpha-tocopherol IM, weekly for 12 weeks, lymphocyte stimulation indices (LSI) were significantly higher than for controls or calves given 1400 mg tocopherol PO. Values were highest for calves treated IM. Serum IgG levels averaged across weeks similarly in all groups, but levels of IgM were significantly higher in calves given the high oral doses.

IBR virus neutralization (VN) tests revealed significantly greater VN at 12 wk by serums from calves in the high oral and IM groups. In a second study, serum alpha-tocopherol and LSI of 12 yearling heifers, determined 7 days after a single IM injection of 2000 mg dl-alpha-tocopherol, were significantly higher than preinjection values. The enhanced cell-mediated and humoral immune responses of heifers given vitamin E suggested such supplementation could increase protection against disease under intensive management conditions.--**P.G. Reddy et al. J. Dairy Sci. 69:164-171, 1986).**

## FELINE GIARDIASIS

Giardia is a widespread and common protozoan parasite of domestic cats, with prevalences of infection ranging from 1% to 11%. Chronic diarrhea, intermittent or continuous, that does not respond to routine antidiarrheal treatments is characteristic of giardiasis, although illness does not necessarily result from infection. Giardia cysts or trophozoites may be detected in the feces of infected cats; however, the small size of the cysts (relative to helminth ova), their transparency and their discontinuous excretion by cats may frustrate diagnosis. Zinc sulfate centrifugal flotation is the method of choice for detection of fecal giardia cysts. Clinically affected cats respond well to oral metronidazole (10 to 25 mg/kg, BID for 5 days) or furazolidone (4 mg/kg, BID for 5 days) treatments. The relationship of Giardia felis to the Giardia spp. of other mammals (including human beings) remains controversial.--**From abstract in JAVMA, Vol. 189, No. 2, July 15, 1986, p. 203 from C.E. Kirkpatrick, J. Small Animal Pract., 27, Feb 1986, p. 69.**

## OPEN HOUSE SCHEDULED AT VETERINARY COLLEGE

Students from the Virginia-Maryland Regional College of Veterinary Medicine at Virginia Tech in Blacksburg will conduct tours of the Veterinary Teaching Hospital and the instructional headquarters of Phase II during an open house on Saturday, April 25 from 9 a.m. to 5 p.m.

The tours will incude an explanation of the academic curriculum and a variety of instructional and medical equipment will be displayed. The open house will also include displays featuring different aspects of the veterinary profession.

Admission is free and refreshments will be provided.

## CONTINUING EDUCATION OPPORTUNITIES

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| April 15-16, 1987 | Small Animal Medicine Update<br>Tidewater (4/15) Charlottesville (4/16) |
| April 23, 1987 | Problems of the Canine Hip<br>Dr. Marvin Olmstead - Richmond, VA |
| April 24-25, 1987 | Canine Hip Problems - Lecture/Wet Lab<br>Dr. Marvin Olmstead - Blacksburg, VA |
| April 26, 1987 | Pet Bird Medicine Workshop<br>Dr. Kevin Flammer - Norfolk, VA |

## THOUGHT FOR THE MONTH

The person who is smiling when things go wrong has
thought of someone to blame it on.

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