Diagnosis and Treating Hypertension

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Causes and signs

Hypertension is often subclinical initially, and as the blood pressure increases, clinical signs may occur both due to the hypertension itself, or be linked to frequently associated medical conditions. Associated signs may reflect the cat's geriatric life stage, cardiac disease, or be associated with the two most commonly linked conditions— hyperthyroidism and renal failure.

One serious clinical finding associated with hypertension is sudden blindness. Retinal detachment and hemorrhage are typical findings. The sooner the cat is treated, the better the prognosis. Ideally, therapy should start immediately or at least within 24 hours of hemorrhage or detachment in order to optimize prognosis for sight. When the retina is not yet detached, mild hemorrhage in the eye may lead to anisocoria or just a reduced PLR if in the early stages, rather than blindness. Ophthalmoscopic examination will allow visualization of retinal changes, though severe retinal detachment can sometimes be seen with the naked eye. Dilation and engorgement of the optic disc-associated blood vessels may be noted especially in early cases, pre-hemorrhage.

Other findings commonly noted in cats presenting in a hypertensive state include PU/PD, gallop rhythm, tachycardia and increased PMI, and bounding pulses. An echocardiogram often reveals thickened LV free wall and IV septum, with a decreased LV volume and internal diameter. If hemorrhage occurs in other organs or nervous system, variable presentations including stroke signs may occur. An interesting note aside is that during venipuncture, it may be observed that a syringe may fill more quickly than normal, and post-procedure bleeding at the entry point may be more pronounced than usual.

When associated with hyperthyroidism, the hypertension is due to thyrotoxic cardiomyopathy leading to an increase in cardiac output. A large percent of cats with hyperthyroidism have associated hypertension.

In chronic renal disease, the hypertension is thought to be due to fluid and sodium retention related to overstimulation of the rennin-angiotensin-aldosterone axis, resulting in increased vascular compartment volume. Reduced vessel capacitance, especially in the venous side occurs along with increased adrenergic and renopressor activation; all factors contributing to an increased cardiac load. Approximately 65% of cats with chronic renal failure are thought to be hypertensive. A portion of Persian cats with polycystic kidney disease may develop increased mean arterial pressure.

Indications for blood pressure measurement

Diseases associated with hypertension include systemic hypertension and renal disease, hyperadrenocorticism, hyperthyroidism, essential or primary hypertension, and pheochromocytoma. Of these, Cushing's disease (dogs) and renal disease are probably the most common. Cats diagnosed as hypertensive are presented to veterinarians for the evaluation of ocular abnormalities (such as dilated pupils, hyphema, or presumed blindness), neurological signs, anorexia, and lethargy. Many cats with renal disease or hyperthyroidism are hypertensive

Measuring blood pressure

Though there is some variation in reported parameters in the literature, it is commonly accepted that a systolic pressure above 160 mmHg indicates clinically significant high blood pressure in cats. Because cats are prone to the so-called "white coat syndrome", which is a stress response due to cortisol release as a result of handling, restraint, or just being in a clinic rather than in a familiar home environment, results of a single blood pressure check should not be considered accurate. Due to this variability associated with performing blood pressure measurements, it is recommended that seven measurements be taken, and that the highest and lowest values be discarded, with the remaining five averaged.

Other tips for accurate measurement include

- Use headphones to ensure that the sound does not stress the patient. This also allows you to hear the sound of the machine more effectively, increasing your accuracy.
- Shave the area for the transducer very short, and apply adequate ultrasound gel so that good contact is ensured. If an assistant can hold the transducer in place, this will likely help because the artery tends to roll around under the skin, and minor adjustments in position often need to be made.
- Just the right amount of pressure on the transducer is essential. Too much and the flow will be reduced, too little and it will slip out of position. Make sure that if a limb is being used, that its position does not compromise blood flow to the extremity where the transducer is in place.
- Use a correctly sized cuff for the patient. Its width should be about 1.5-2 times the diameter of the antebrachium. Inflate the cuff slowly if the patient is awake to ensure they are not startled.

Treatment of hypertension

In cats, the standard approach is to complete a thorough diagnostic evaluation and ideally, establish an underlying cause and treat it. Concurrently, the use of an anti-hypertensive agent will assist with normalization of blood pressure. Hyperthyroid cats may not need

lifelong medication to control blood pressure once the hormonal disturbance is controlled. A low sodium diet such as Hills K/D® is prescribed, but like any new food in cats, should be gradually introduced to ensure that the patient adjusts to the new taste. Amlodipine (Norvasc™), a calcium channel blocker, is most commonly selected to counteract hypertension. The usual initial dosage is 0.625 mg/cat/24h (1/4 of a 2.5 mg tab), and if not effective after 48 hours, the dose can be doubled. If still not providing good improvement, an ACE inhibitor (e.g., benazepril) is sometimes added to the regimen. Benazepril has been approved in Europe for treating kidney failure in the feline. The suggested European label dose is 0.5 mg/kg SID. Sometimes amlodipine is compounded into a suspension for easy administration. It is very important to shake the suspension well before each dosing to make sure that it is properly distributed in the liquid. In moderate to severe cases, diuretics may be used in the first few days to enhance blood pressure reduction. Furosemide (Lasix™) is dosed at 1 mg/kg/12 hr PO. Close monitoring of blood pressure is important because hypotension may potentially occur, especially with combination therapy.

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