Canine systemic hypertension

What is systemic hypertension?

Systemic hypertension refers to a high pressure in the arteries that supply blood to most of the organs (except the lungs).
This high pressure can have acute or long-term consequences on any organ in the body, but four organs are particularly at risk of suffering from a high blood pressure (because they are vital organs, with a lot of blood supply and/or with fragile blood vessels).
These four organs are the brain, the heart, the eyes and the kidneys. The disease induced by a high blood pressure in these organs is called "target organ damage".

What are the signs of systemic hypertension?

- In the eyes, high blood pressure can cause acute blindness due to detachment of the retina (layers of cells at the back of the eye that are responsible for sending signals to the brain so vision is possible) or bleeding within the eye. This can in turn cause increased pressure in the eye, which can cause pain.
- In the heart, high blood pressure can cause a progressive thickening of the heart muscle, which can ultimately cause heart dysfunction (heart failure). It can also promote an abnormal heart beat (arrhythmia), which can be life-threatening in some cases.
- In the kidneys, high blood pressure can excessive loss of protein in the urine, which can promote kidney disease and ultimately kidney dysfunction, as well as promoting throwing of blood clots.
- In the brain, high blood pressure can cause bleeding (which can be life-threatening) within the brain (which can be life-threatening) or generalized brain dysfunction which can manifest as seizures, decreased responsiveness, or a comatose state.

How is systemic hypertension treated?

The treatment of systemic hypertension relies on:
- Medications to lower the blood pressure (a range of medications with different mechanisms of action is available).
- Investigation and treatment of the underlying cause of hypertension. This can be challenging depending on the underlying cause.

What causes systemic hypertension?

In dogs, the most common causes of systemic hypertension are:
- Kidney disease. The kidneys produce some hormones that regulate the blood pressure. When the kidneys are not working normally, there can be an over-production of hormones that raise the blood pressure
- Excess of cortisol (the stress hormone). This is called hyperadrenocorticism and is usually due to an over-production of cortisol by the adrenal glands ((small glands located near the kidneys) due to a tumour.
- Excess of catecholamines (fight-or-flight hormones). This is due to a tumour of the adrenal glands that results in over-production of the fight-or-flight hormone.

Occasionally, other less common diseases can cause systemic hypertension.

How is systemic hypertension diagnosed?

Like in humans, the blood pressure can be measured in dogs.
However, the stress of being in the hospital (white coat effect causing situational systemic hypertension) must be taken into consideration. Situational hypertension does not cause harm but can make the diagnosis of true systemic hypertension difficult and lead to over-diagnosis of the condition. Therefore, it is usually recommended to measure the blood pressure several times in a row and on several occasions to ensure true systemic hypertension is present (before starting treatment or investigations for an underlying cause).

What is the prognosis?

The prognosis is variable but depends on the underlying cause of hypertension, response to treatment, and presence or not of irreversible organ damage. Except for fight-or-flight hormone producing tumours that can be challenging to address, systemic hypertension is usually not difficult to treat and dogs can live a normal life.

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