

Chronic Kidney (Renal) Failure in Cats

There are many different diseases that can affect the kidneys in the cat. Chronic renal failure (CRF) is the end point of a number of different disease processes. All animals have a large amount of reserve kidney function hence signs of renal failure are not usually seen until more than 75 % of the kidney's functional capacity have been lost.



Even at this point, changes may be very subtle with few if any outward signs, the kidney disease only being apparent on blood and urine testing. As CRF is primarily a degenerative disease, it is most common in old cats. By the time a cat is showing signs of CRF, the underlying cause is often of little importance the disease having advanced beyond the point at which treatment of the cause is likely to be possible or helpful.

What are the signs of CRF?

In the early stages, signs of CRF are very non-specific and can be difficult to distinguish from the general signs of ageing. An increased thirst (polydipsia) and increased urination (polyuria) may be seen, however cats remain able to concentrate their urine until quite late on in the disease so this is not always evident. In addition, in cats that go outdoors, increased drinking and urinating may simply not be noticed. The most commonly noticed signs are dullness, anorexia, weight loss and halitosis. Halitosis can be a useful indication of renal disease, however, it is also associated with dental disease which is very prevalent in older cats. Cats with kidney disease may also have a poor hair coat and a weak gait. Some cats may vomit due to the build up of waste products within the blood stream. Occasionally, cats will present with sudden onset blindness associated with bleeding into the eye or retinal detachment as a result of high blood pressure (hypertension). Hypertension is commonly associated with CRF.

Although the loss of the kidney's functional ability is a slow and gradual process, some cats seem to present with a very sudden onset of signs. It is likely that these cats have been coping (compensating) by an increase in fluid throughput enabling them to excrete their waste products over a larger volume as they are no longer able to concentrate their urine adequately. Eventually a threshold is reached when they are no longer able to compensate and clinical signs appear suddenly. The deterioration may be triggered by a relatively minor event such as a short period of starvation or vomiting causing mild dehydration with which the diseased kidneys are unable to cope.



How is CRF diagnosed?

Renal failure is diagnosed by a combination of blood biochemistry tests that show an increase in substances that should normally be excreted by the kidneys in the urine, and urine tests that show a reduced concentration of the urine. Urea and creatinine are the most common substances that are measured in the blood as an indication of reduced kidney function. An increase in urea and creatinine in the blood is termed azotaemia.

However, increases in urea, in particular, can be the result of non-renal factors such as dehydration or low blood pressure which reduce blood flow to the kidneys. An inadequate blood supply means the kidneys cannot fulfil their functions and toxins build up in the circulation. This is termed pre-renal azotaemia, and is usually relatively easily managed by restoring circulating volume with fluid therapy.

Post-renal azotaemia is caused when urine can't leave the body and again toxins build up in the blood stream. This is especially common in 'blocked' male cats with feline lower urinary tract disease (FLUTD) and needs emergency treatment.

Acute renal failure occurs when there is a sudden, severe insult to the kidneys. This can be caused by toxins e.g. antifreeze poisoning or severely reduced blood flow to the kidneys. Urea and creatinine levels will increase rapidly. Emergency treatment is needed to save the cats life.

What other tests may need to be done to improve management?

Besides the excretion of nitrogenous waste, the kidneys have a number of other important functions. Kidney disease in an individual is unique, as the disease will have affected the different kidney functions to varying degrees. It is important, therefore, to gain as much information in all of these areas so that management can be optimised. This may require further blood tests, urinalysis, radiographs, ultrasound or even biopsy of the kidney.

Major roles of the kidney

- Excretion of waste products
- Excretion of bioactive substances such as gastrin which causes acid secretion in the stomach
- Regulation of water balance
- Regulation of blood acidity
- Regulation of electrolytes - calcium, phosphorus, potassium, sodium and chloride
- Production of hormones – renin (involved in water balance and blood pressure regulation) and erythropoietin (causes the bone marrow to produce red cells)
- Activation of vitamin D (involved in calcium regulation)



Management of chronic renal failure

Management will vary with the precise problems of an individual cat, the ease with which the patient can be medicated and financial considerations. Possible treatments that may be necessary include :-

- Rehydration
- Correction of blood acidity
- Appetite stimulation
- Management of nausea and vomiting
- Treatment of hypertension
- Treatment of anaemia
- Potassium supplementation
- Control of increased blood phosphate levels (hyperphosphataemia)
- Treatment of reduced blood calcium (hypocalcaemia)
- Antibacterial (antibiotic) therapy
- Treatment to reduce protein loss through the kidneys

In cats that present with severe disease, prompt and aggressive treatment may be necessary to stabilise their kidney function. In the longer term, much can be achieved with a combination of some of the above treatments and dietary management. A number of tinned and dry diets are available, specifically designed to help in the management of cats with chronic renal failure.

Dietary therapy for CRF

The major aim of dietary therapy is to improve clinical signs associated with azotaemia, such as vomiting, inappetence and lethargy. Specialised diets have reduced protein which will lower blood urea levels one of the major toxins making the cat feel unwell. Dietary potassium levels are increased and phosphate levels decreased, as low blood potassium and high blood phosphate are common complications of CRF in cats.

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