Renal diets in cats with chronic kidney disease

Clinical scenario
Chloe, a 14-year-old domestic shorthair cat, has just been diagnosed with IRIS late stage II kidney disease. She is not proteinuric and her blood pressure is normal. You have stabilised her azotaemia and her appetite is now good. What is the benefit of a kidney prescription diet for this cat?

The question
In [cats with naturally occurring chronic kidney disease] does [a renal prescription diet compared to normal diet] increase the [survival time] of affected cats?

Search strategy
The search strategy can be viewed at https://bestbetsforvets.org/.

Search outcome
- 13 papers found in Medline search
- Four papers excluded as they did not meet the question
- Six papers excluded as they were review articles/in vitro research/conference proceedings
- Three total relevant papers from Medline
- Six papers found in CAB search
- One paper excluded as it did not meet the question
- Four papers excluded as they were review articles/in vitro research/conference proceedings
- One total relevant paper from CAB
- Three relevant papers from both Medline and CAB Abstracts.

Summary of evidence

Paper 1: Survival of cats with naturally occurring chronic renal failure: effect of dietary management (Elliot and others 2000).

Patient group: Cats with naturally occurring chronic renal failure, n=50.

Study type: Cohort study.

Outcomes: Survival time to a maximum of three to six years (end point not well defined), general health status, blood pressure; biochemical parameters; parathryoid hormone and urinalysis were measured.

Key results: The median survival for the renal prescription diet was 633 days (338 to 950), and 264 days (190 to 535) for the normal diet (P=0.0036). In the normal diet group, 68.8 per cent died of end-stage renal failure compared to 47.6 per cent in the renal diet group. There was no significant difference in creatinine between groups (no P value given). Phosphate levels were significantly higher at the mid- survival point in the cats on the normal diet when compared to the renal diet (P=0.008). Ten cats needed phosphate binders in the renal diet group; this was not offered in the normal diet group. Potassium supplementation was required by 23 per cent of cats in the normal diet group and 27.5 per cent of cats in the renal diet group.

Study weaknesses: No power calculation was reported. A small sample size at the start of the study (n=29 on renal diet, n=21 on normal diet). Renal patients were not staged, all patients had to be azotaemic and have poor urine concentrating ability. The formulation of the available renal diet changed towards the end of the study. Parathyroid hormone and phosphate were monitored and the therapy adjusted for cats in the renal diet group but not in the normal diet group.

ELLIO T, J., RAW LINGS, J. M., MARKWELL, P. J. & BARBER, P. J. (2000) Journal of Small Animal Practice 41, 235-242

Paper 2: Clinical evaluation of dietary modification for treatment of spontaneous chronic kidney disease in cats (Ross and others 2006).

Patient group: Client-owned cats with spontaneous stage 2 or 3 chronic kidney disease, n=45.

Study type: Randomised controlled trial.

Outcomes: Survival for two years, ureaemic crisis as the end point; physical examination; ocular examination; body condition score; biochemistry parameters (including ionised calcium); parathyroid hormone; complete blood cell count; blood gas analysis; urinalysis; urine culture and blood pressure were measured.

Key results: Eleven of 22 cats on normal diets died of renal disease and none of the 23 cats on the renal diets died of renal disease. Urea (P<0.001) and creatinine (P=0.08) were significantly higher, and HCO3 (P<0.001) was significantly lower, in the renal diet group. Ten cats needed phosphate binders in the renal diet group; this was not offered in the normal diet group. No power calculation was done to determine the optimal size of the study. Small sample size at the start of the study (n=22 on renal diet, n=23 on normal diet). Only 30 cats remained in the study for the full 24 months. Urea (P=0.009) and creatinine...
(P=0.09) were significantly higher and HCO3 (P=0.009) significantly lower in the normal diet group compared to the renal diet group at the start of the study. This may have affected the results, as the azotaemia was worse in the control group.

ROSS, S. J., OSBORNE, C. A., KIRK, C. A., LOWRY, S. R., KOEHLER, L. A. & POLZIN, D. J. (2006) Journal of the American Veterinary Medical Association 229, 949-957

Paper 3: Dietary management of naturally occurring chronic renal failure in cats (Harte and others 1994).

Patient group: Cats with chronic renal disease, n=35.

Study type: Randomised controlled trial.

Outcomes: Renal survival to 24 weeks; clinical signs; bodyweight; biochemistry parameters and urinalysis were measured.

Key results: Bodyweight was maintained in the renal diet group but deteriorated in the control group. All cats showed clinical deterioration, but this was ‘less apparent’ in the renal diet group. Packed cell volume (PCV), albumin and total protein increased in the renal diet group but fell in the control group. Creatinine and urea increased in the control group and decreased in the renal diet group during the study. These differences were reported to be ‘significantly different’.

Study weaknesses: No power calculation was done to determine the optimal size of the study. Small sample size at the start of the study (n=22 on renal diet, n=23 on normal diet). No basic data provided before or after treatment allocation made. No P values were given in the results, so not possible to assess if the groups were significantly different following treatment.

HARTE, J. G., MARKWELL, P. J., MORAILLON, R. M., GETTINBY, G. G., SMITH, B. H., WILLS, J. M. (1994) Journal of Nutrition 124, 2660S-2662S

Comments
The studies all used different definitions of chronic kidney disease/failure and measured the cats’ survival for different periods of time. The Elliot and others study is a cohort study, which is a weaker form of evidence than a randomised controlled trial when assessing a treatment effect. There was not enough detail in the report by Harte and others to fully assess the quality of the study. The Harte and others study was funded by Waltham Centre for Pet Nutrition whose parent company made the renal diet.

Other studies were found during the search using young cats with surgically induced renal failure. We deemed that the results of these studies were not applicable to cats with naturally occurring chronic renal failure, so they were excluded from the BET.

Bottom line
A renal diet will improve the survival time of a cat with chronic kidney disease.

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