What Is the Evidence?

Problem

A 14-year-old neutered male domestic shorthair cat was examined for gradual weight loss. The owners reported recent increases in water consumption and frequency of urination, which was indicated by the litter pan requiring more frequent cleaning than in the past. Physical examination revealed the cat weighed 3.2 kg (7 lb) and had a body condition score of 2 on a 5-point scale. During palpation, the left kidney felt small and irregular; the right kidney could not be palpated. No thyroid nodule was palpable. Multiple readings of systolic arterial blood pressure were obtained, and no values were higher than the upper reference limit (160 mm Hg).

Blood samples were collected for a CBC, serum biochemical analysis, and determination of serum thyroxine concentration. Results of laboratory tests indicated the cat had mild, nonregenerative anemia (PCV, 34%; reference limits, 36% to 50%) and azotemia (SUN concentration, 45 mg/dL [reference limits, 10 to 30 mg/dL]; serum creatinine concentration, 2.5 mg/dL [reference limits, 0.4 to 1.8 mg/dL]). Analysis of a urine specimen obtained by cystocentesis revealed isosthenuria (specific gravity, 1.012), no evidence of proteinuria (urine protein-creatinine ratio, 0.1; reference limit, < 0.2), and no bacterial growth. Results of other laboratory measurements, including serum thyroxine concentration, were within reference limits. A tentative diagnosis of naturally occurring chronic kidney disease (CKD) was made.

The International Renal Interest Society staging system has been developed to help guide appropriate treatment and monitoring of patients with renal disease. By that system, staging is initially based on serum creatinine concentration assessed in a stable, well-hydrated patient from which food has been withheld. The patient's condition is then staged on the basis of existing degree of proteinuria and risk of hypertensive complications. Given the aforementioned findings, the cat of this report was assessed as having stage 2 nonproteinuric CKD, with a low risk of hypertensive complications and a serum creatinine concentration between 1.6 and 2.8 mg/dL.

Formulation of the Clinical Question

Guidelines for conservative management of patients with CKD have been outlined.1,2 For cats, these guidelines include the following: feed a therapeutic diet for cats with renal disease, ensure adequate nutrition, maintain serum phosphorus concentration less than the target value, maintain serum potassium concentration within the target range, correct metabolic acidosis, maintain hydration, correct clinically apparent anemia, ameliorate gastrointestinal signs, reduce the magnitude of proteinuria, and minimize systemic hypertension. Therefore, the clinical focus shifted to the value of feeding a therapeutic diet and ensuring adequate nutrition.

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Clinical Question

For a cat with CKD, does nutritional management improve quality of life (ie, delay the onset of uremic crises and reduce the risk of future uremic episodes) or slow progression of the disease (ie, delay death)?

Evidentiary Search Strategy

A practical and efficient evidence-based approach to decision making was desired. Therefore, instead of an exhaustive literature search and critical review, a targeted bibliographic search was performed. The PubMed database and major veterinary internal medicine and clinical nutrition textbooks were searched with the following keywords: feline, uremia, chronic kidney disease, and renal failure. A 20-minute search identified several studies in which dietary modification was evaluated in cats with experimentally induced or spontaneous CKD.

Review of the Evidence

The clinician was familiar with the outcomes of basic research conducted on this topic and sought additional evidence on the subject to confirm details of nutritional management of CKD. Two clinical studies were identified in which the effect of dietary modification for treatment of cats with naturally occurring CKD was evaluated. A prospective, nonrandomized, nonmasked study3 in cats with CKD was performed to compare outcomes in cats that consumed therapeutic foods designed for cats with renal disease4 with outcomes in cats that would not accept the therapeutic foods and continued eating their usual food. Information about staging of CKD was not available; however, mean ± SD serum creatinine concentrations at the beginning of the study were 2.89 ± 0.15 mg/dL in the usual food group and 3.16 ± 0.25 mg/dL in the therapeutic food group. Cats that consumed the therapeutic food had a median survival time of 633 days, whereas cats that consumed their usual food had a median survival time of 264 days.

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References:

The other study involving cats with stage 2 or 3 CKD was a prospective, randomized, controlled, masked clinical trial in which the effects of consuming a therapeutic food\(^7\) were compared with those of consuming an adult maintenance food. In that study, no cats that consumed the therapeutic food developed a uremic crisis or died of renal causes while enrolled in the study, whereas 26% of cats that consumed the adult maintenance food developed a uremic crisis and 22% died of renal causes. Evidence also exists for use of dietary modification in cats with experimentally induced CKD.\(^6,7\) Results of those studies supported the results of clinical studies in cats with naturally occurring CKD.

Given the aforementioned evidence, what decision would you make?

**Clinical Decision and Outcome**

The owners reported that their cat typically consumed a dry, adult maintenance food and also caught voles and other small mammals in the pastures surrounding the owners’ home. Compared with typical adult maintenance cat foods, therapeutic foods for cats with CKD are typically designed to avoid excess protein, phosphorus, and sodium and have increased amounts of omega-3 fatty acids, potassium, B-complex vitamins, dietary acid-buffering ability, and antioxidants. The cat of this report was judged similar to the cats enrolled in the referenced clinical trials; therefore, the findings of those trials were weighted heavily when formulating a decision about the suitability of therapeutic food. Because the cats in the experimental studies did not have naturally induced disease, the results of the studies were accorded less weight when formulating a decision about the suitability of therapeutic food for the cat in this report. On the basis of all evidence, use of a therapeutic food was strongly recommended.

The owners chose to offer both a dry and moist formula of a commercial therapeutic food.\(^3\) New dry food was gradually introduced over a 4- to 6-week period by mixing increasing amounts with the regular dry food. The new moist therapeutic food was offered in small amounts several times daily, and hunting was discouraged. The cat readily accepted the dietary change and maintained its body weight. Clinical signs and results of laboratory tests were monitored every 6 months for the next 3 years. Azotemia and isosthenuria persisted, but clinicopathologic values remained stable until the last few months of life, when metabolic acidosis and further weight loss developed.

**Discussion**

Renal disease, occurring in almost 2% of cats > 7 years of age and 10% of cats > 10 years of age, is commonly diagnosed by private veterinary practitioners in the United States.\(^8\) The high prevalence of renal disease suggests that veterinary practitioners should develop evidence-based therapeutic strategies for managing cats with these disorders.

The best evidence-based decisions are made when research evidence is combined with clinical expertise, patient values, and available resources.\(^3,8\) The concept of patient values from human medicine must be extended to include the unique preferences, concerns, and expectations of each owner as well as those of their pets (ie, the patients). No formal process was used to combine the experiences of the supervising clinician with review of available data regarding therapeutic food in the treatment of CKD. Thus, the therapeutic recommendation was a combination of best evidence and clinical experience. In veterinary medicine, information from high-quality clinical studies is often not available to support clinical decision making. However, in the situation reported here, several good clinical studies in cats with naturally occurring disease provided strong evidence upon which to make a therapeutic decision. On the basis of the evidence, use of a therapeutic renal food was strongly recommended, provided owner and patient preferences were satisfied.

A common complaint about therapeutic renal foods is that patients, particularly cats, will not eat them. A gradual transition over several weeks from the old to the new foods allowed cats to readily accept the dietary change. Indeed, results of 1 randomized, controlled clinical study\(^7\) indicate that most cats with CKD (> 90%) will accept change to a therapeutic food designed for renal disease with use of a gradual transition program and will continue eating the food. In that study, body weight and condition were maintained for 2 years, whether the cats were eating a therapeutic food or an adult maintenance food.

References