Changes in Nutritional Status of Patients with Chronic Renal Failure on a Low Protein Diet

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Dear Sir,

Low protein diets are widely used as an effective means of slowing the progression of chronic renal failure [1] and of relieving symptoms of uraemia. A major concern with this therapy is malnutrition, which may lead to an increased mortality on dialysis [2]. Low protein diets have been used routinely in the Leicester Renal Unit since 1985. The effect of this treatment on nutritional status has been examined and subsequent mortality compared with the period before 1985 [3].

139 patients were started on a low protein diet between January 1985 and March 1990. 3 patients were already on the diet in 1985. 2 patients with malignant disease were excluded. Mean age was $50.3 \pm (\text{SD}) 18.3$ years. 85 were male. Underlying renal diseases were chronic pyelonephritis 25, chronic glomerulonephritis 13, polycystic disease 22, diabetes mellitus 19, obstruction 10, hypertension 8, miscellaneous 26 and unknown 19, 3 patients were nephrotic and 5 vegetarian. Mean serum creatinine concentration at the start of the diet was $555 \pm 152 \mu\text{mol/l}$ (range 284-1,043). Diets contained 0.6 g protein/kg ideal body weight/day supplemented with low protein products with a calorific value of 600 kcal. Prescribed energy intake was 35 kcal/kg ideal body weight/day. Glucose polymers were used in those initially taking less than this and in those whose anthropometric measurements declined on the diet. Standard anthropometric measurements were made monthly. Follow-up for the study was continued until dialysis or September 1990. Data were analysed using generalised linear interactive modelling.

Median follow-up of all 142 patients was 16 months (range 5 months to 8.6 years). 79 patients started dialysis during this time, after a median of 13 months (range 5 months to 8.6 years). Median body mass index (weight/ height²) at the start of the diet was 24.5 kg/m² (16.1-41.4). Body weight declined on the diet by 0.64%/year (95% confidence interval. CI = -0.34 to -0.95%, $p < 0.0001$). The rate of weight loss did not vary consistently with the time from starting the diet. No clear trend was detected in arm muscle circumference (mean

1.00

1985-1990 (LPD)

S 0.75

CA

0.50

1984-1985 (all patients)

0.00

10

Time, years

Fig. 1. Survival in years, obtained by the method of Kaplan and Meier, for the whole dialysis population between 1974 and 1985 [3] compared with that for patients started on dialysis since 1985 who had been treated with a low protein diet (LPD).

Within the limitations of the small numbers of patients dying, the diet did not significantly influence mortality.

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rate of change = -0.22%/year, 95% CI = + 0.02 to -0.46%) or in triceps skin fold thickness (mean rate = -1.2%/year, 95% CI = +0.56 to -2.96%). Serum albumin concentration increased by 0.72%/year (95% CI = +0.20 to + 1.24%; $p = 0.0007$). 7 patients died on the diet, 9 have subsequently diet on dialysis.

Changes in body weight were not significantly related to age, sex, underlying renal disease, commencement on dialysis or death on the diet. Subsequent survival on dialysis was not significantly different from that of the whole dialysis population between 1974 and 1985 (fig. 1).

Patients with moderate to severe chronic renal failure, routinely treated with a low protein diet, progressively lost body weight. From this uncontrolled study, it is not clear whether this was due to the diet or to the progressive uraemia. However, the increase in serum albumin suggest that loss of body water rather than lean or fat mass contributed to the decrease. More detailed studies of body composition are required to clarify this [4].

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