The effect of dietary protein restriction on the progression of diabetic and nondiabetic renal
diseases: a meta-analysis


Authors' objectives
To assess the efficacy of dietary protein restriction in previously published studies of diabetic and non-diabetic renal diseases.

Searching
MEDLINE was searched from 1966 to December 1994 for English language articles. References in review articles, and other papers written by the authors of published trials, were also examined.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) were selected for non-diabetic renal disease, and for diabetic nephropathy, RCTs or time series (with non-randomised crossover design) were selected.

Specific interventions included in the review
Dietary protein.

Participants included in the review
People with either non-diabetic renal disease (n=1,413) or diabetic nephropathy (n=108) were included.

Outcomes assessed in the review
End-stage renal disease, or death and arterial blood-pressure, were assessed in people without diabetes; in people with diabetic nephropathy, changes in glomerular filtration rate, creatinine clearance or urinary albumin excretion rate, arterial blood-pressure and glycosylated haemoglobin, were assessed.

How were decisions on the relevance of primary studies made?
Studies had to examine the effect of low-protein diets in humans with chronic renal disease. The authors do not state how decisions on the relevance of primary studies were made, or how many of the authors performed the selection.

Assessment of study quality
Studies were excluded if they were not full-length published studies, if they had a mean length of follow-up of less than 9 months, or if they did not use intention-to-treat analysis. The authors do not state how the papers were assessed for validity, or how many of the authors performed the validity assessment.

Data extraction
The data were extracted by two independent reviewers, and any differences were resolved by discussion.

Methods of synthesis
How were the studies combined?
The overall effect was calculated using both random-effects and fixed-effect models; only the results produced by the random-effects model are presented since both sets of results were similar. The data are presented as risk ratios with 95% confidence intervals (CIs). Separate analyses were carried out for the 2 groups of patients.

How were differences between studies investigated?
Heterogeneity in the relative risk (RR) among studies was assessed using the chi-squared test.
Results of the review

Ten studies in total: 5 for non-diabetic renal disease and 5 for diabetic renal disease (3 RCTs and 2 of a crossover design).

Non-diabetic renal disease.

There were no statistically-significant differences in the RR for renal failure or death between studies. Pooled results showed that dietary protein restriction significantly reduced the risk for renal failure or death (RR 0.67, 95% CI: 0.50, 0.89, p = 0.007), compared with the usual protein diet. There were no statistically-significant differences in arterial blood-pressure between groups.

Diabetic nephropathy.

There were no statistically-significant differences in the RR for outcomes between studies. Pooled results showed that dietary protein restriction significantly reduced the risk for decline in glomerular filtration rate or creatinine clearance, or increase in urinary albumin excretion rate (RR 0.56, 95% CI: 0.40, 0.77, p<0.0001). There were no statistically-significant differences in arterial blood-pressure or glycosylated haemoglobin between groups.

Authors' conclusions

Dietary protein restriction significantly delays the progression of both diabetic and non-diabetic renal disease. Results in non-diabetic renal disease provide sufficient justification to recommend dietary protein restriction for well-informed patients with chronic renal disease and renal insufficiency.

Results in diabetic renal disease do not provide a strong justification for the use of dietary restriction protein in routine general practice, but on the basis of clinical judgement, dietary protein restriction should be recommended to selected patients.

CRD commentary

No attempt was made to locate unpublished studies and indeed 1 study was excluded as it was unpublished. The authors include tables presenting information about each individual study, but which omit information on the type of renal disease studied. Overall, this seems to be a good-quality review.

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.