



The 'Atkins' diet: an evaluation

No diet books have been as widely read as Dr Atkins' *New Diet Revolution* and its companions.¹ An American obesity prevalence of 27% in 1999 is continuing to increase, and with 45% of American women and 30% of American men seeking to lose weight at any one time, it is obvious that the public has a keen interest in diets that will provide weight-loss success. Until now there have been no randomised studies comparing the low-carbohydrate high-fat, high-protein (Atkins) diet with the more conventional high-carbohydrate, low-fat, low-protein diet. This omission has been remedied by the publication of the results of two studies, albeit with equivocal results.

Foster and colleagues² compared the effects of the two diets on normal obese subjects with respect to weight loss and cardiovascular risk factors (blood cholesterol, triglyceride concentration, blood glucose, insulin resistance and blood pressure). Subjects were assigned to receive either the low-carbohydrate (Atkins) diet ($N = 33$) or the high-carbohydrate diet ($N = 30$). Of the 63 subjects initially enrolled, 37 completed the 1-year trial (20 on the low-carbohydrate and 17 on the high-carbohydrate diet). The low-carbohydrate group showed a greater weight-loss up to month 6, but by 12 months, there was no significant difference between the two groups. There were no significant differences in total serum cholesterol between the two groups after 12 months, but there was an increase in high-density lipoproteins (HDL) and a decrease in triglyceride concentration in the low-carbohydrate group. Blood pressure,

insulin resistance and glucose tolerance did not change significantly in either group. The overall effect of the low-carbohydrate diet in comparison with a conventional diet on the risk of coronary disease is uncertain. The findings cannot be generalised to overweight subjects with serious obesity-related diseases such as diabetes and hypercholesterolaemia. Another limitation was the high attrition rate and small number of subjects.

Samaha and colleagues³ compared the two diets in severely obese subjects with a high prevalence of diabetes or the metabolic syndrome. There were 64 subjects in the low-carbohydrate group, and 68 in the high-carbohydrate group. Seventy-nine of the 132 subjects completed the 6-month trial (43 in the low-carbohydrate group and 36 in the high-carbohydrate group). The results were similar to Foster's study – the weight loss was greater in the low-carbohydrate group than in the high-carbohydrate group. Triglyceride levels decreased in the low-carbohydrate group, but there was no significant change in lipid levels in either of the groups. Blood pressure tended to drop by about 2 mmHg in both groups. This study, say the authors, proves a principle, but does not offer clinical guidance. Studies evaluating long-term cardiovascular outcomes are needed before a carbohydrate-restricted diet can be endorsed.

How then does one interpret the data from these studies? Ware, accompanying editorial,¹ says that the reader's ability to draw definitive conclusions about the relative efficacy and safety of carbohydrate-restricted and fat-restricted diets in these trials is limited by the large

percentages of participants who were lost to follow-up. The definitive analysis of randomised clinical trials is the intention-to-treat analysis, which includes all patients in the groups, irrespective of whether they complied fully or not. However, to perform an intention-to-treat analysis, all participants must be followed to the time of completion of the study. In these two studies, the investigators did not do this. A number of analytical methods have been used, but none of them, according to Ware, are defensible in the typical clinical trial, given that those who drop out are likely to differ from those who remain in the study. All of these methods are suspect in the context of a diet trial.

In these two studies there is something to be learned about low-carbohydrate diets: they do provide greater weight loss initially than high-carbohydrate diets, but this appears not to be maintained for a full year. 'It is unfortunate, however,' says Ware, 'that so much effort must be devoted to evaluating the implications of missing observations when a seemingly simple effort to obtain study weights according to the follow-up protocol would probably have been successful with most participants.'

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References

1. Ware JHN. *Engl J Med* 2003; **348**: 2136-2137.
2. Foster GD, et al. *N Engl J Med* 2003; **348**: 2082-2090.
3. Samaha FF, et al. *N Engl J Med* 2003; **348**: 2074-2081.