

## Diet and obesity

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A number of questions about diet and obesity which have implications for management are the subject of this chapter.

### Diet and pathogenesis

Although the understanding of the way in which diet contributes to the development of obesity is incomplete, some assessment of its possible role relative to other factors and in various situations is useful in clinical evaluation.

### AGE

Obesity can have its onset at any age and the time until assistance is sought will vary. A young adult woman may have been obese since childhood, adolescence or after pregnancy. There are difficulties in retrospective assessment of food intake (Byers et al. 1983) and of physical activity patterns but, if it can be done, then more insight is gained by the obese individual and the counsellor into pathogenetic factors for that individual and management can be more appropriate.

Recovery from infantile obesity is common (Poskitt and Cole 1977, 1978) but not as common later in childhood (Myres and Yeung 1979). Dietary restriction in puberty is hazardous because of potentially adverse effects on growth and development. Prevalence of obesity increases pre-pubertally, and decreases especially in males, in early and mid-adolescence. In late adolescence and early adulthood presumably because of a failure to reduce energy intake after the growth spurt (or to increase energy expenditure), it again increases (Garn and Clark 1976; Rutishauser 1982). Failure to return to pre-pregnancy weight post-partum is a particular problem for women who may not have needed previous recommended increments in energy intake during preg-

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nancy (Durnin et al. 1985). Yet food restriction during pregnancy can be a risk for the unborn child (Commonwealth Department of Health 1982). With advancing years, a reduction in energy expenditure may not be accompanied by a reduction in energy intake with a consequential increase in the level of adiposity (James 1986; Schneider et al. 1986; Wahlqvist and Flint 1986).

#### STEADY-STATE OBESITY

If weight and body composition are constant, then energy intake must be appropriate for needs. The time when it was excessive was when adiposity increased – as at various vulnerable ages. A reduction of energy intake below need is required to reduce adiposity, but ought not to be the case for maintenance. However, that need will depend on the extent to which lean body mass has been maintained and, it should be remembered, the energy cost of moving a lesser body mass in a given physical activity will be less.

#### RELATIVE IMPORTANCE OF FACTORS AFFECTING ENERGY BALANCE

These factors include:

- i) energy intake
- ii) altered energy expenditure
  - (a) Physical activity including that at rest, domestic, occupational and recreational, each with varying degrees of mechanical efficiency.
  - (b) Maintenance of lean body mass which contributes a major part of resting metabolic rate.

From the prospective Zutphen study in The Netherlands (Kromhout et al. 1982), those who had a higher energy intake lived longer and, in the prospective London study of Morris et al. (1977), men were less likely to die of coronary heart disease if the energy intakes were higher. In both studies, however, dietary fibre or plant food intakes were greater in the survivors. Thus caution must be exercised in advice to maintain lower levels of adiposity through reduced energy intakes. The preferred approach may be to increase the level of physical activity and lean body mass. In the short term, to control obesity, reduced energy intake as well as increased energy expenditure may be warranted.

#### MACRO-NUTRIENT COMPOSITION

Avoidance of what have been regarded as carbohydrate-rich foods has become part of folklore in regard to reduced risk of obesity. Carbohydrate craving has been suggested as a basis for obesity in a subgroup of obese individuals (Wurtman and Wurtman 1985). However, so-called carbohydrate-rich foods are often also fatty foods, examples being sweet biscuits, pastries and ice cream. Rats have been shown to prefer, overeat and become obese on sweet-fat foods (Hamilton 1964). These foods may be preferred by obese people (Gates et al. 1975) and hedonistic responses to food in humans can be shown dependent on sugar-fat interactions (Drewowski 1985).

#### PREVIOUS EFFORTS TO LOSE WEIGHT

There is the problem in contemporary industrialized societies that many perceive themselves overweight when, from a health point of view, they are not (Biddulph et al. 1984). Restriction

of food intake in these and other individuals may lead to loss of lean body mass with a corresponding reduction in metabolic rate. Such individuals, if not physically active, may be more prone to an increase in adiposity when higher energy intakes are resumed. More work is required in this area.

Loss and regain of body water with radical diets can also lead to a misunderstanding about the relationships between food intakes and adiposity. This, in turn, can mitigate against further rational attempts to decrease levels of adiposity.

#### FOOD AND NUTRITION BELIEFS

There are various food and nutrition beliefs which might contribute to the development and maintenance of obesity, some of which will be evident from the above discussion. Examples would be:

- i) 'Since most obesity is determined in early life, little can be done about it.' This belief ignores data about different ages of onset and propensities to recovery.
- ii) 'People who are fat are the ones who overeat.' This belief fails to recognize that there are varying efficiencies of energy utilization in both obese and non-obese people (Garrow 1985) and also fails to acknowledge the dynamics of the development of obesity and the possibility of new steady-state conditions.
- iii) 'Exercise does not help, because it increases appetite.' This belief ignores the fact that appetite is more appropriate to need when one is active rather than sedentary (Carey and Read 1982).
- iv) 'Carbohydrate foods lead to obesity.' This belief ignores the role of energy dense fatty foods and of alcoholic beverages.
- v) 'Diet does not work for me.' Experience with reduced energy intake or reduced carbohydrate intake for short periods of time where most initial weight loss is water loss, inevitably re-gained as normal eating practice resumes, can be misinterpreted as inability to lose body fatness.

#### When to intervene with diet

The first consideration, as far as any possible dietary intervention for obesity is concerned, is what the patient's reasons for wanting weight loss are. It is possible that other assistance than with weight loss may be worthwhile or even more appropriate. Further, the patient's reasons are likely to be more motivating than those of the medical or nutritional counsellor. For example, the patient's real concern may be how she is regarded by her children's school friends or the problem of dyspnoea on effort; these concerns can be specifically addressed, or can be the focal point of dietary intervention according to circumstances.

Some assessment of health risk of the obesity is required before embarking on dietary advice. Using the Body Mass Index (BMI,  $\text{weight/height}^2 \text{ kg m}^{-2}$ ), Garrow (1981) has graded obesity from 0-III (Table 1). Preferred BMI has principally to do with mortality. Risk of morbidity also needs to be taken into account (Bray 1985).

Some families are at greater risk of obesity-related disease than others, type II (non-insulin dependent) diabetes mellitus being one of the best examples. Members of such families may be more strenuously counselled about obesity prevention. Some food cultures may be relatively more

TABLE 1

Assessment of the likely severity of obesity.

Body Mass Index	Grade	Clinical significance
20-24.9	0	Minimal mortality
25-29.9	I	Slight mortality increase, but important to prevent progress from this grade
30-40	II	At mid-point, mortality double that of Grade 0
>40	III	Incompatible with normal employment or health

protected against some effects of obesity than others; for example, a high carbohydrate, high dietary fibre, low fat diet can alter the expression of type II diabetes (Wahlqvist 1984). The interaction between obesity and other lifestyle variables, such as cigarette smoking, is also of consequence (Lew and Garfinkel 1979). It is also now clear that distribution of body fatness will influence a decision about dietary advice (Larsson et al. 1984).

Obesity in later life requires special consideration as one is now dealing with survivors. Elderly obese may still have the quality of life improved by dealing with obesity and, as life expectancy improves, a progressive reappraisal of the extent to which obesity is a determinant of life expectancy of the aged needs to be undertaken. Dietary restriction, however, in those who are already often on reduced food intake because of reduced physical activity can be risky in terms of adequacy of food intake (Reed et al. 1985; Wahlqvist and Flint 1986).

### Endpoints for dietary management

There are more ways of helping obese people from a nutritional standpoint than weight reduction and these can be agreed endpoints with the patient at the outset of management.

#### CHANGES TOWARDS A NUTRITIONALLY ADEQUATE AND PRUDENT DIET

Obese persons may engage in dietary practices where essential nutrient intake is precarious and where other nutritionally-related risk factors for major diseases of developed countries, such as hypertension through sodium and ethanol intake and hyperlipidaemia through saturated fat intake, are increased.

#### CHANGES IN BODY COMPOSITION

Greater changes in body composition than in weight may take place where a programme also includes some physical training as well as diet. These may be better appreciated through monitoring of body circumferences and skinfold thicknesses.

#### PHYSICAL FITNESS

There may be appreciable improvements in physical fitness with little weight change. Exercise programmes may allow, for example, less dyspnoea and more agility and, overall, better ability to cope with obesity.

## WELL-BEING

This is, as yet, poorly measured in clinical practice, but it is what is frequently sought by patients.

### Diet in reduction of body fatness

From what has already been said, restriction of energy intake can play a useful role in reduction of body fatness although for maintenance of this preferred body composition, the emphasis should be more on physical activity with extra food, to meet these needs of exercise, being low in fat.

Although very low energy intakes and the associated greater initial weight loss can be motivating for patients, it must be appreciated that, from food, sufficiently high nutrient densities are hardly achievable so as to allow intakes of less than 800 calories (3340 kJ) and adequate essential nutrient intake. In selected patients, for periods up to 2 months, it may be possible to use meal-replacement programmes with nutritionally complete formula feeds so that daily energy intake is in the region of 400–500 calories (1670–2090 kJ) (Wadden et al. 1983). Careful medical selection and supervision of this approach ought to be a requirement at this stage. Moreover, it is clear that, for maintenance of the initial weight loss with these programmes, combination with behavioural therapy is an important strategy (Stunkard 1985).

To increase dietary fibre intake in its own right has been popularized as a way of increasing satiety (Haber et al. 1977). Few well controlled studies have been carried out on the use of dietary fibre in weight control, but two recent studies lend some support to this approach (Rassner-Ockerman 1986; Rossner et al. 1986).

For both reduction and maintenance, combination of diet with other strategies is usually required. At the very least, these will include exercise and behavioural approaches. In selected patients, appetite suppression and surgical techniques may also be required.

### Diet in the maintenance of preferred body composition

The major problem in the management of excess adiposity is recidivism. Reference has already been made to the value of exercise and behavioural approaches in maintenance. But all of this takes time and must be acknowledged in the initial contract between counsellor and patient. Consultations at various frequencies, over 1–3 years should be envisaged (Kalucy 1985).

For those with more severe forms of obesity, gastric surgery has yielded satisfactory maintenance of weight loss with follow-ups in excess of 10 years (Kral 1985; Mason et al. 1985). Since food intakes of such patients who have undergone gastroplasty may continue at a particularly restricted level, regular review of nutrient intake and specific nutrient status assessed haematologically and biochemically is highly desirable. With growing numbers of these individuals in the community, this will be an increasingly important part of clinical practice.

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