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Nutritional Management of the Elderly Person with Diabetes

MARY HICKSON AND LUCY WRIGHT

Charing Cross Hospital, London, UK

INTRODUCTION

Diabetes is a common chronic disease of older people and is found with increasing frequency with advancing years (1). The true prevalence can only be estimated as probably half of all cases are undiagnosed (2). When the diagnosis is made it is often at a time of an intercurrent illness or a stressful life event. Today the majority of people with Type 2 diabetes could be considered elderly with most being over 60 years of age (3,4). In Western societies, where the population is increasingly aged, the prevalence of diabetes is set to rise further. Population changes in the level of background obesity and increased assimilation of people from ethnic groups with a higher rate of diabetes (3) will also contribute to this rise. Nevertheless diabetes in the older age group is still heterogeneous, consisting of:

- A small but increasing population of elderly patients with Type 1 diabetes;
- Elderly patients with established Type 2 diabetes;
- Elderly patients with newly diagnosed Type 2 diabetes;
- Transient forms of diabetes secondary to an intercurrent or underlying disease or treatment.

The dietary and medical management of elderly individuals with diabetes will depend on the aetiology of their glucose intolerance as well as their other medical and physical co-morbidities.

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The clinical presentation of Type 2 diabetes in older age is often insidious and unlike the acute symptoms frequently seen in younger individuals. A gradual and unrecognised rise in blood glucose can occur over many years and be accentuated by some of the physiological changes associated with ageing:

- Increased fasting hepatic glucose production,
- Decrease in beta cell mass,
- Changes in beta cell secretory function,
- Change in body composition,
- Increase in insulin resistance.

While all these physiological changes occur with advancing age, the contribution that each can make to the development of overt diabetes will vary between subjects. Unlike other age groups, Type 2 diabetes is not uncommon among lean elderly individuals who are often characterised by a marked reduction in insulin secretory function. By contrast, obese elderly Type 2 patients are more typically insulin-resistant (5,6).

Most diabetes associated complications are dependent on a product of the duration of diabetes and the glycaemic control. Concerns about the development of microvascular complications need to be balanced against the likely life expectancy of an elderly individual who develops Type 2 diabetes in later life. In some cases it may be more appropriate to focus on ameliorating glycaemic symptoms, if any, and promoting general well-being rather than striving for euglycaemia. The older people who develop diabetes in their later years have different clinical needs than a similar aged person with diabetes of many years' duration. Elderly patients with Type 2 diabetes of longer duration are more likely to have diabetic micro- and macrovascular complications and a more aggressive approach to their glycaemic control may be warranted (7,8,9). As improving glycaemic control has been shown to improve cognition, one should continue to strive for acceptable glycaemic control whenever possible and appropriate (10).

Type 2 diabetes is associated with significant co-morbidities (11,12), many of which lead to physical and mental disability (13,14). All management plans have to take an holistic approach, as any one of the co-morbidities may take precedence over the actual management of the diabetes.

With no specific dietary diabetic guidelines for the older age group, advice has usually been based around the same recommendations as for all adults with diabetes. Clearly these need to be individually modified and at times liberally interpreted. Important factors to consider when giving dietary advice to this age group are:

- Functional and mental ability,
- Polypharmacy,

- Co-morbidities,
- Dependency on others.

CURRENT DIETARY RECOMMENDATIONS AS APPLICABLE TO THE OLDER PERSON WITH DIABETES

Current European recommendations are based on studies in younger age groups, which have then been extrapolated to the elderly. The quality of evidence for the specific effects of dietary intervention in older age groups is poor.

The most recent European recommendations for adults with diabetes are shown in Table 10.1 (15). They emphasise energy balance and weight control, and recognise a wide variation in carbohydrate intake as being compatible with good diabetic control. The target of nutritional management is to help optimise glycaemic control and reduce the risk of cardiovascular disease and nephropathy. However, the quality of life of the individual person must be considered when defining nutritional objectives and health care providers must achieve a balance between the demands of metabolic control, risk factor management, patient well-being and safety. Compliance with all treatment modalities is likely to be compromised by increasing physical and mental disabilities, which occur more frequently in the ageing population.

If beneficial changes to the diet of an elderly person with diabetes are to be achieved, access to dietetic services is needed. The following topics should be considered: body weight, physical activity and the specific micronutrient composition of the diet including carbohydrates, protein, alcohol, sodium, vitamins and minerals.

BODY WEIGHT

The National Diet and Nutrition Survey of people aged 65 years and over (16) showed that two-thirds of free-living elderly were overweight or obese. While only 3% of men and 6% of women in the community were underweight, this figure rose to 17% for the elderly in institutions. Undernutrition in acutely ill hospitalised elderly patients has been estimated at 26% (17).

A BMI range of $24-29 \text{ kg/m}^2$ has been suggested as appropriate for the elderly population (18), especially for individuals above 70 years of age, as this higher than conventional BMI range has been associated with lower mortality rates. Morley suggested weight reduction only be considered in patients 20% above their desirable body weight (19) and then a BMI of 29 may be a safer and more realistic target for older people to achieve.

Weight loss of between 5–10% from initial body weight is known to benefit blood pressure, glycaemic control and lipid profiles, with a 10% weight loss

Table 10.1 Summary of the Europear	recommendations, 1999
	Recommendation
Total dietary energy	No specific recommendation unless the person is overweight or gaining weight, when a reduction in total energy intake is advised
Body weight	Ideally BMI 19-25. Those overweight should be encouraged to lose weight. Weight gain should be avoided
Activity Carbohydrate	All should be encouraged to engage in moderate activity for 20–30 min most days Acceptable range 45–60% of total energy A combined intake of 60–70% of total energy is recommended for carbohydrate and
	monounsaturated with <i>cis</i> configuration fatty acids. The proportions will vary according to the individual's clinical state and preferences
Fat	Caroonyurake should not contaving a row giyeacure mack are particularly reconnected Sucrose intake should not exceed 10% of total energy Accentable rance 75–35% of total energy
	Saturated and <i>trans-</i> unsaturated fatty acids to provide less than 10% of total energy Polyunsaturated fatty acids not to exceed 10% of total energy
	Monounsaturated fatty acids with <i>cis</i> configuration in combination with carbohydrate should provide 60–70% total energy
	One portion of oily fish/week plus other plant sources are recommended for <i>n</i> -3 fatty acids
Protein Cholesterol	Intake should be between 10–20% of total energy Should not exceed 300 mg/day
Dietary supplements	Fish oils or their derived preparations and pharmacological doses of vitamins are not
Vitamins and antioxidant nutrients	Foods naturally rich in dietary antioxidants and other vitamins should be encouraged
Fruit and vegetables	Five portions a day
Folate Sodium	Regular consumption of foods with readily bloavailable folate (citrus fruits and legumes) Restrict salt intake to less than $6g/day$
Alcohol	Recommendations for the general public apply. Recommends 15 g for women and 30 g for men per day as acceptable for most
	When using insulin or sulphonylureas it is advised to consume alcohol with carbohydrate-
'Diabetic' foods	containing foods These are not recommended Non-nutritive sweeteners can be useful in drinks

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required to provide long-term improvements in patients with Type 2 diabetes (20). Even though weight loss will improve glycaemic control and symptoms (20), weight loss in this group can be hard to achieve due to decreased activity levels.

Over the age of 65 years there is an age-related loss in body fat and lean body mass, reversing the tendency to increased fat deposition in middle age. During these years the number of underweight individuals increases, particularly in institutions and in the presence of acute illness. It is extremely important to identify these underweight and malnourished individuals when providing dietary advice. Factors influencing undernutrition are discussed later in this chapter.

ACTIVITY

As people get older activity levels generally fall. The presence of co-morbidities such as arthritis can significantly affect functional ability, which in turn further limits physical activity. This fall in activity contributes to being overweight and makes losing weight harder. The benefits of exercise for all people with diabetes are well documented and are irrespective of body weight or age. Exercise will lead to an improvement in metabolic and cardiovascular risk factors as well as improving strength, flexibility, balance and function (21).

The recommendation of 30 min moderate activity on most days is achievable for many older people – it does not have to be 30 continuous minutes and can consist of any light activity, e.g. walking (22). Moderate intensity has a very different meaning at the age of 70 years compared to the age of 30 years, and in general individuals should be encouraged to do what they can achieve, do it regularly and gradually build up in intensity and frequency. Even very frail older people can manage certain activities and over time should be able to gradually improve their strength. For some older adults whose mobility is severely restricted, activities may need to be adapted to the individual's abilities, e.g. chair, arm and non-weight-bearing exercises. Some types of very strenuous activity are contraindicated, for example in patients with known ischaemic heart disease or severe retinopathy (23).

CARBOHYDRATES

Fibre is a particularly important component to encourage in an older person's diet. Constipation is common and increasing fibre intake can reduce laxative use and improve bowel function. However, fibrous foods tend to have a greater satiating effect and should be advised with caution for those with depressed appetites.

Foods with a low glycaemic index (GI) should also be encouraged to improve glycaemic control in patients with diabetes. However, the compliance to dietary advice in general is often poor and providing more complex advice around GI foods may not necessarily achieve the level of compliance required to be beneficial.

PROTEIN

The European Association for the Study of Diabetes recognised that the recommendations for the protein content of the diet are based on incomplete evidence. Concerns exist about the development of nephropathy with a high protein intake (24,25). Overall the incidence of nephropathy in the elderly population has increased over the last 20 years. One possible explanation is that the improved treatment of coronary heart disease and hypertension has resulted in more patients with Type 2 diabetes living long enough to develop nephropathy and end-stage renal failure (ESRF).

In a recent review of the literature that looked at protein ranges between 0.3-0.8 g/kg bw/day, high protein intakes contributed to the development of nephropathy (24–26). Reducing protein intake appears to slow the progression to renal failure, however the level of restriction that is both effective and acceptable to patients is unknown. The current literature is based mainly on individuals with Type 1 diabetes and often uses proxy indicators such as creatinine clearance rather than hard clinical end-points such as time to dialysis or death from ESRF. In another meta-analysis of the literature dietary protein restriction was shown to have only a relatively weak effect on slowing the rate of decline in renal function (27).

Current European recommendations suggest that patients with diabetes, who exhibit evidence of microalbuminuria or established nephropathy should have a protein intake at the lower end of the normal range (0.7–0.9 g/kg bw/day). This level is compatible with the current medical literature and the 1985 WHO guidelines (28,29). Protein intakes below this increase the risk of malnutrition during chronic illness or catabolic states. While not commonly a problem, in some elderly patients with diabetes the balance between the risk of malnutrition and the possible benefits of a reduced protein intake to delay nephropathy need to be carefully assessed.

ALCOHOL

Older people are more susceptible to the effects of alcohol and are likely to develop problems at relatively lower levels of consumption. The reduction in body water content and lean body mass with advancing age results in a smaller volume of distribution for the alcohol (30). Higher peak blood alcohol concentrations occur in older than younger subjects matched for body size and sex, yet ethanol clearance does not appear to be altered by age (31).

Moderate intakes of alcohol appear to benefit blood pressure, glycaemic control and reduce the risk of thrombosis (32). Alcohol can also act as an appetite stimulant and this can be beneficial. Large intakes however have been shown to increase the risk of stroke, hypertension, hypoglycaemia and both lactic and ketoacidosis (33). Patients should be encouraged to limit their intake to 1–2 units per day for women, or 2–3 units per day for men. Due to the age-related body composition changes, the lower end of these ranges is probably preferable.

SODIUM

Taste and smell declines with age, beginning around 60 years but becoming more marked above 70 years (34). Salt and monosodium glutamate are commonly used as taste enhancers and can improve dietary intake in elderly people (35). However, sodium intake is linked with the development or exacerbation of hypertension (36), and when salt intake is reduced blood pressure can fall (37). A balance between using flavour enhancers to encourage dietary intake for underweight people, while not exacerbating hypertension, needs to be made.

VITAMIN AND MINERALS

The National Diet and Nutrition Survey of people aged 65 years and over provides valuable data on the current eating practices and nutritional status of elderly people in the UK (16). Areas of concern highlighted in this report were the inadequate intakes of folate, vitamin D, vitamin C, vitamin K, iron and magnesium. Of the survey population 10–40% were shown to have multiple vitamin deficiencies and 10% were anaemic. Levels of deficiencies were higher when an individual was receiving institutionalised care.

The micronutrient status of elderly individuals with diabetes is controversial. The literature is limited and recommending any intervention should be done with caution until further research is undertaken. The literature on selected vitamins and minerals such as chromium, B vitamins and selenium in diabetes has been reviewed (38). The authors conclude that micronutrient supplementation for people with diabetes should be individualised and based on clinical findings, dietary history and laboratory results.

Some of the questions surrounding certain nutrient supplementation are particularly relevant to the management of the older patient with diabetes. These include vitamins for wound healing and bone health. Pressure sores develop in 4-10% of newly hospitalised patients, increasing to 14% in long-term elderly care (39). Patients with diabetes are a vulnerable group with poor wound healing. To date there is insufficient evidence to support the routine supplementation of micronutrients for wound or leg ulcer healing using either

multivitamins or vitamin C with or without zinc. Improved healing of leg ulcers and wounds has been reported following three months' zinc supplementation given as 70 mg of zinc three times a day (38). However a review on nutrition and wound healing by Albina concluded that while supplementation of hospitalised patients with zinc and vitamin C may be reasonable (40), routine use of vitamin C supplementation alone is unlikely to be beneficial (41). The UK Department of Health currently recommends a reference nutrient intake of 40 mg of vitamin C daily (42), but not routine supplementation. These vitamin C requirements are based on the prevention of scurvy, and further research on the benefits of higher intakes is still required.

All elderly people are at risk of fractures due to falls and osteoporosis, but when diabetes is present this risk may be further increased by peripheral neuropathy, autonomic neuropathy, hypoglycaemic episodes and poor eyesight.

In 1998 the Department of Health recommended the reference nutrient intake for calcium for people over 50 years of age to be 700 mg daily (43), with this being obtained from milk and milk-based foods. The National Osteoporosis Society (NOS) has set its recommended daily calcium intake higher in order to meet individual rather than population needs. The NOS recommend a level of 1500 mg for people over 60 years of age.

Older people are vulnerable to vitamin D deficiency due to an age-related decline in vitamin D synthesis and less sunlight exposure. Sunlight on the skin in the UK from May to September should be sufficient for vitamin D synthesis for most adults. The Department of Health suggests that the face and arms be exposed for 30 min per day (43). Vitamin D supplementation should be considered for all elderly housebound individuals and other groups unable to achieve this exposure. A daily vitamin D intake of $10 \,\mu g$ is recommended and if dietary intake is less, vitamin D by tablet or as a six-monthly injection is required.

Further research is needed to clarify the assessment of vitamin and mineral status in elderly patients with diabetes and to develop appropriate guidelines on the need for supplementation.

OTHER CONTRIBUTING FACTORS TO NUTRITIONAL HEALTH IN THE ELDERLY PATIENT WITH DIABETES

Undernutrition is as much a concern in older patients with diabetes as obesity (44). There are lifestyle changes and functional and cognitive problems that can cause inadequate dietary intake in these patients, as addressed below.

ORAL HEALTH

Diabetes adversely affects oral health, increasing the risk of gingivitis and other oral infections. Gingivitis is a major cause of tooth loss and pain that can affect oral intake. Saliva flow protects against dental caries but age, drugs and diseases can reduce this. Poor oral and dental health is linked with chewing difficulties that can cause malnutrition, poor general health and reduced quality of life (45,46).

Population changes in oral health and dentition over the last 30 years have resulted in fewer older people with no natural teeth – declining from 37% in 1968 to 12% in 1998 and predicted to fall to around 2% by 2018 (47). There are dietary implications for those with no teeth or partial dentures, as difficulties in eating can lead to a reduction in the variety of food choices and an overall reduction in nutrient intake. A 15% drop in energy intake has been reported in free-living elderly people without any natural teeth. Full dentures, in particular, can lead to a reduction in food consumption due to the mouth feeling full, a greater time needed to eat causing embarrassment and changes in food flavours (48).

All patients need to be encouraged to maintain good oral hygiene, with special attention given to those with dry mouths or who eat more frequently due to a small appetite or, in the case of a person with Type 1 diabetes, due to the need for frequent snacks. Dental advice is required for patients with chewing difficulties, pain and other oral health problems. However, it should be recognised that elderly patients may have mobility problems getting to a dentist. In addition, many elderly patients have perceived barriers to dental care, the major ones being fear and costs (47).

SENSORY LOSSES

Loss of taste and smell can influence the enjoyment of food and decrease motivation to eat and drink. Such sensory losses occur naturally as a function of age (49) as well as with certain diseases, such as cancer. Adding ready-to-use flavour enhancers containing monosodium glutamate (MSG) may improve dietary intake and thus reverse weight loss, improve immunity, functional status and quality of life (34,50,51).

When the thirst sensation is decreased, dehydration can occur. Many elderly patients deliberately reduce their fluid intake to reduce their urine frequency, which may be increased due to glycosuria and prescribed diuretics. The recommended minimum daily fluid intake is 1500 ml (approximately 7–8 cups/ glasses), but this will be higher for patients with poorly controlled diabetes since urinary output is increased (52).

SOCIAL FACTORS

Eating is not just a feeding process, but an important social event. Food choices and access to food can be affected by numerous factors including bereavement, immobility and isolation. All can affect the motivation to eat and enjoy food. The ability to shop and prepare meals decreases with age (16), with 30% of men and 50% of women reported as housebound or requiring assistance to shop when over 85 years of age (53). The available and discretionary income may also fall with age. It is therefore difficult for many elderly patients to follow a prescribed diabetic diet especially as many luncheon clubs, community meals, day centres and ready meals do not cater specifically for people with diabetes.

PHYSICAL FACTORS

Functional limitations such as mobility and illness affect nutritional status. Elderly people with diabetes have increased levels of disability and immobility that affect all aspects of daily living, including shopping, meal preparation and leisure activities (54).

Patients with diabetes are at an increased risk of a stroke and any resultant neurological deficit can lead to eating problems and malnutrition (55,56). The most frequently encountered eating problems are hoarding food in the mouth, poor lip seal leading to leakage of food, dysphagia and chewing problems. Careful observation at mealtimes, and assessment by a speech therapist if necessary, will enable identification of specific eating problems. For some patients, eating in front of people can be a traumatic and embarrassing event, further reducing food intake.

PSYCHOLOGICAL AND COGNITIVE FUNCTION

Any level of psychological or cognitive deficit may lead to a poor or erratic diet affecting both nutritional state and glycaemic control. Memory lapses can result in missed meals and medication or an inadvertent repeated dose of some medications leading to, amongst other things, hypoglycaemia. Cognitive function is also impaired in people with diabetes due to increased incidence of cerebrovascular disease and depression (57,58). Psychological problems are both a predictor of mortality and of hospital admissions (59). Food intake can be markedly reduced in the presence of dementia. VOICES (Voluntary Organisations Involved in Caring in the Elderly Sector) produced a report in 1998 regarding the specific nutritional needs of elderly people with dementia (60).

Cognitive deterioration in patients with diabetes may be made worse by nutritional deficiencies (61) and poor glycaemic control. Cognitive function

with documented improvements in problem solving, attention, concentration, memory and learning ability have been reported with better glycaemic control (10).

Figure 10.1 summarises many of these factors and offers strategies for their treatment.

OTHER CONSIDERATIONS WHEN ADVISING OLDER PEOPLE WITH DIABETES

DELAYED GASTRIC EMPTYING

Hyperglycaemia delays gastric emptying (62) as do multiple other factors, many of which remain poorly understood. Physiological inhibitory pathways exist that control gastric emptying and involve small intestinal receptors that are stimulated by nutrients in the lumen of the gut. Posture, meal size and meal composition all influence gastric emptying through activating these receptors. Dietary fat empties at a slower rate than protein or carbohydrate and liquids empty faster than solids.

A modest degree of gastroparesis occurs with ageing. However, this is much commoner in people with diabetes; upto half of all patients with long-standing diabetes (both Type 1 and 2) have some evidence of delayed gastric emptying (62). Gastroparesis affects both glycaemic control as well as oral hypo-glycaemic drug absorption, and in elderly people may precipitate post-prandial events, which may lead to loss of consciousness and falls.

Delayed gastric emptying can be asymptomatic, making the diagnosis difficult. Symptoms, if present, include nausea, vomiting and abdominal fullness. However, none of these symptoms correlate well with gastric emptying. Patients presenting with gastrointestinal symptoms, who already have diabetic complications, in particular autonomic neuropathy, are major candidates for this condition or other disorders of gut motility. Hyper-glycaemia may contribute to these symptoms as it has been reported to increase the perception of sensations arising from the gut (63).

Delays in gastric emptying can reduce the rate of drug transit and slow the rate of absorption. A few studies have been conducted in patients with diabetes that demonstrate a correlation between the absorption of glibenclamide and glipizide and gastric emptying time (62). With drugs that have a long half-life and are given long-term, this effect would not be expected to lead to significant alterations in blood concentrations of the drug.

Gastric emptying can affect glycaemic profiles. Rapid gastric emptying can cause glycaemic spikes and a worsening of control. On the other hand, when gastric emptying is delayed a mismatch with the onset of hypoglycaemic drug action and glucose absorption can occur, leading to hypoglycaemia.



Source: Reproduced from the British Dietetic Association's Nutrition Advisory Group for Elderly People (64). Figure 10.1. Taking steps to tackle eating problems

The most successful treatment for gastroparesis remains pharmacological. Dietary advice should focus on preventing weight loss and malnutrition. Eating and drinking separately and advice encouraging small frequent meals and snacks can improve symptoms. Supplements may be needed if specific nutrients are deficient or malabsorption is present.

RISK OF HYPOGLYCAEMIA

The risk of, and fear of, hypoglycaemia is a major reason why diabetes is undertreated in older people. The Diabetes Control and Complications Trial in Type 1 diabetes and the UKPDS trial in Type 2 diabetes clearly demonstrated that secondary complications could be decreased by tight glycaemic control, but this increased the risk of hypoglycaemia (65,66). Hypoglycaemia is a particular problem in older patients with Type 1 diabetes as hypoglycaemic awareness decreases with duration of diabetes and advancing age. In addition, older patients with Type 2 diabetes treated with hypoglycaemic drugs are particularly prone to hypoglycaemia if dietary intake is variable. General frailty, polypharmacy, renal impairment and frequent hospitalisations are all risk factors for hypoglycaemia (67). Hypoglycaemic symptoms are frequently unrecognised and, when they are recognised, may not be treated appropriately.

There are no established glycaemic goals for the older patient. Sinclair has recommended pre-meal targets of 6–8 mmol/l and 7–9 mmol/l at bedtime, with less stringent levels for individuals with recurrent hypoglycaemia (68). The St Vincent Joint Task Force for Diabetes final report emphasises selecting glycaemic targets on an individual basis and focusing management goals on elevated lipids and blood pressure (69).

Dietary management on how to avoid hypoglycaemia is discussed in detail elsewhere in this book. As for any hypoglycaemic episode, rapidly absorbed carbohydrate should be consumed, followed by longer lasting carbohydrate. Education of elderly patients and their carers on how to avoid hypoglycaemia is important, and emphasis should be placed on regular meals and ensuring adequate carbohydrate with each meal.

MEDICATION

The choice of a single oral agent for the elderly individual with Type 2 diabetes is made predominately on the basis of weight, clinical assessment of insulin resistance and renal function. Lean patients with Type 2 diabetes are more likely to need an agent to increase their circulating insulin levels (e.g. sulphonylureas or insulin) while obese patients may require an agent to reduce insulin resistance (e.g. metformin or a glitazone).

Sulphonylureas with a long biological action, such as glibenclamide, increase the risk of hypoglycaemia in elderly people (70). Reduced renal function delays

the excretion of some active drug metabolites and increases the risk of hypoglycaemia. Sulphonylureas with shorter biological actions, such as glicazide or the older tolbutamide (metabolised by the liver) are associated with less hypoglycaemia. Metformin is effective in obese older patients as it indirectly increases insulin sensitivity, promotes weight loss and is not associated with hypoglycaemia when given as monotherapy. Renal function should be monitored in patients taking metformin (71) and not used when renal impairment is present or if there is severe anorexia. Age should not be a barrier to starting insulin and is often required for elderly patients with Type 2 diabetes, who can usually cope well with the new insulin pen devices (68).

Elderly people are at risk for drug-nutrient interaction, a problem which has been reviewed by Lewis *et al.* (72) and Roe (73). Drugs can interfere with nutrient intake, absorption, metabolism and excretion. Foods can interact with drugs, altering their absorption and action. For example, bulking agents, such as methylcellulose, can decrease appetite by creating a feeling of fullness. Metformin reduces vitamin B_{12} absorption, diuretics increase urinary loss of potassium and magnesium and warfarin can affect vitamin K metabolism. Food in general may decrease the absorption and absorptive rate of aspirin, while fibre can specifically reduce the absorption of digoxin. It is important to be aware of these interactions and to ensure sufficient intake of nutrients to prevent any potential nutritional deficiencies.

ACUTE INTERCURRENT ILLNESS

As with any adult with diabetes who becomes ill, older people should be encouraged to take regular carbohydrate and sufficient drinks while continuing their medication. As their appetite may be reduced, small frequent drinks may be more tolerable and acceptable. Older people should be advised to prepare for illness by keeping suitable foods stored for such an eventuality, e.g. long-life or dried milk, tinned milk puddings, fortified drinks, tinned and dried foods, UHT fruit juice, porridge oats or other cereals, etc.

GUIDELINES FOR PRACTICE IN NURSING AND RESIDENTIAL HOMES

Results from studies of the prevalence of diabetes in nursing and residential homes range from 7.2–17.5%, see Table 10.2.

When self-reporting questionnaires are used to obtain prevalence figures in residential care an underestimate of the true prevalence occurs, as diabetes is often undiagnosed. Available prevalence studies show that diabetes is more common among the ageing population in care than in the community.

The three UK studies indicate that the majority of patients are treated using diet and tablets, followed by diet alone and finally diet and insulin. The most recent study carried out in Sheffield also investigates the patterns of diabetes

Study	Year	Method	Rate (%)
South Glamorgan (74)	1997	Questionnaire	7.2
Liverpool (75)	1998	Questionnaire	9.9
Canada (76)	1998	Questionnaire and random venous glucose sampling	17.5
Sheffield (77)	2000	Questionnaire	8.8

 Table 10.2 Studies examining the prevalence of diabetes in care homes

care and the level of training received by the staff in these institutions. Their results show that very few homes in the area employ staff with specialised training in diabetes care and that diabetes management is poorly structured. They also show that the majority of homes do not give patients the choice to manage their own treatment, being instead encouraged to follow the routine within the establishment. Similar results were found by Tong *et al.* (78) in 1994, where those in care homes received fewer services than those in their own homes in terms of annual review and access to therapists (chiropodist, dietitian and optician).

Looking more specifically at dietary care there are two interesting American studies. One investigated the benefits of a 'diabetic' diet for nursing home residents and found only insignificant differences in glucose control (fasting glucose increased on average only 0.6 mmol/l) when patients followed the normal diet instead of the 'diabetic' diet (79). Both diets met the recommended dietary allowances for the age group and body weight did not change significantly despite a slightly increased calorie intake on the normal diet. This raised the question as to whether care homes need to routinely provide special 'diabetic' diets. However this study was only short in duration (16 weeks, eight weeks on either diet), and the participants were all in good health, maintained good glycaemic control before entry to the study and were not obese. The second study by Funnell and Herman investigated local standards of care for nursing home patients with diabetes (80). This was conducted using a questionnaire and chart review of a sample of the patients with diabetes. The results showed that although most homes had some diabetes care orders and protocols, in general the care did not meet local or national standards. Care practices were closer to national standards if dietitians participated in meal planning and written institutional policies existed. These results highlight the need for dietetic input into residential and nursing homes to provide education as well as assessing and monitoring patients.

In 1999 the British Diabetic Association (now Diabetes UK) produced guidelines of practice for residents with diabetes in care homes (81). This comprehensive report is the only document currently available providing a framework for standards of diabetes care within care homes. It aims to identify major issues relating to the nature and delivery of diabetes care within care homes and to determine the current evidence base in the published literature. The report emphasised the need to monitor weight, provide each patient with an individualised diet and nutritional plan for their care, and obtain the input of a state registered dietitian.

The report's recommendations concerning diet and nutritional care included the following.

- 1. Each resident should expect to have:
 - The opportunity to play an active role in self-diabetes care according to their abilities.
 - An individualised dietary and nutritional plan as part of the overall care plan.
 - Access to community health professionals including a community dietitian.
- 2. Each care home should expect:
 - Training for staff and catering staff on diet and diabetes, which is jointly funded through the health and social care budget at a district, regional and national level.
- 3. Each district should have at least one community dietitian whose primary responsibility is the provision of dietary and nutritional support for residents within care homes.

Individualised care and choice about treatment are also reflected in the National Service Framework for Older People for England, although no specific recommendations are given regarding diabetes. The Caroline Walker Trust and VOICES have both produced reports providing detailed guidelines for the nutrient provision in care homes. One report covers the general care home population and the other is specifically for residents who have dementia (see 'Useful resources' section for details).

The need for skilled individualised nutritional care is highlighted by the number of factors that can contribute to nutritional problems, as listed in Table 10.3.

GUIDELINES FOR PRACTICE IN HOSPITAL

Two-thirds of hospitalised patients with diabetes are aged 65 years or older (82) and these patients have more hospital admissions and stay longer than nondiabetic patients (83). There is evidence that undernutrition is prevalent on admission in this patient group and that this can worsen during the hospital stay (84). Contributing factors are listed in Table 10.3.

Two reports entitled 'Hungry in Hospital' (85) and 'Not because they are old' (86) document the inadequacy of the meal service to elderly patients in

 Table 10.3
 Factors contributing to management difficulties in care home residents with diabetes

- Loss of appetite.
- Poor food intake, exacerbated by reduced food choice or unnecessary food restrictions, inflexibility of meal times, reduced food availability, poor knowledge of care home staff.
- Weight loss, which may be unidentified due to lack of routine weighing.
- Difficulties feeding self or unable to feed self.
- Poor glycaemic control related to poor intake.
- Physical impairments, such as reduced dexterity, poor mobility, etc.
- Cognitive impairments, e.g. acute confusion, depression, dementia.
- Communication difficulties, e.g. dysphasia and dysarthria, confusion, deafness.
- Multiple co-morbidities.
- Polypharmacy.
- Dysphagia, which may lead to need for modified texture diet further restricting food choice and palatability.
- Increased incidence of infections, leg ulceration and pressure sores with corresponding increases in nutritional requirements.
- Sensory impairments such as vision, taste, smell and hearing.

hospital. Improving hospital food in the UK was the objective of the 'Better Hospital Food' campaign, launched in 2001 and aimed at creating new NHS hospital menus to encourage patients to eat more. It is hoped that the quality and style of hospital food can be improved using standardised recipes and ward housekeepers. The British Association for Enteral and Parenteral Nutrition has produced a report putting forward food as treatment, summarised in Table 10.4.

If dietary measures are not enough, prescribed nutritional supplements may be used. The use of oral supplements and sip feeds has recently been reviewed (88). Nutritional supplement preparations are suitable for patients with diabetes under medical supervision, the principal aim being to ensure an adequate energy intake. Once the person has recovered their appetite, long-term

 Table 10.4 Key areas for improvements to the hospital meal service (87)

- Staff training on the importance of nutrition in hospital.
- Staffing on wards, e.g. clear definitions of roles and responsibilities of staff at mealtimes, additional staff at mealtimes.
- Nutrient content of meals, e.g. energy-dense meals for the acutely ill or undernourished.
- Individual nutrition screening of all patients to provide baseline information such as physical problems, weight changes, food and fluid intake.
- Improved distribution and service such as timing of meals.
- Increasing the budget for hospital food.
- Regular auditing of nutrition screening and assessment of nutritional care.

plans to maintain adequate food intake may need to be devised. Enteral feeding has been used successfully in the management of dysphagia following stroke and in supplementing oral feeding in undernourished old people (89).

AREAS FOR FUTURE RESEARCH

The benefits of striving for optimal glycaemic control in older people to prevent long-term complications needs to be balanced against the short-term risks and consequences of hypoglycaemia (7). Further research is needed to establish under what circumstances intensive treatment to achieve good glycaemic control is justified, and whether optimising blood pressure and lipid profiles has a greater influence on morbidity and mortality.

SUMMARY

It is important that dietetic advice to elderly patients with diabetes is tailored to the individual and their specific nutritional needs. As chronological age is often a poor indicator of the ageing process, an individual's physical and mental profile needs to be assessed and addressed. Advising older patients requires balancing health needs with quality of life issues.

USEFUL RESOURCES

The British Dietetic Association's Nutritional Advisory Group for Elderly People (NAGE) publishes a range of resources to assist in the dietary management of older people. Further information can be obtained from the British Dietetic Association, 5th Floor, Charles House, 148/9 Great Charles Street, Birmingham B3 3HT or on the web site at www.bda.uk.com.

Diabetes UK provides a range of resources for patients and health care professionals and can be contacted at 10 Queen Anne Street, London W1G 9HL or www.diabetes.org.uk.

The Caroline Walker Trust distributes two guidelines relating to care of older people: Eating Well for Older People and Eating Well for Older People with Dementia. Further information can be obtained from 22 Kindersley Way, Abbots Langley, Hertfordshire WD5 0DQ or www.cwt.org.uk.

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