Clinical nutrition in primary health care

Part 2: Assessment, diagnosis, presentation and management

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■ Nutritional diagnosis and management are important aspects of general practice. This information, presented in two parts, offers the general practitioner a practical framework and an approach to nutritional advice.
Part 2 covers protein malnutrition, eating disorders, osteoporosis, nutrient toxicity, cancer, inherited metabolic disorders, nutrient deficiency and diabetes mellitus.

(Part I, outlining the clinical conditions and principles involved in nutritional diagnosis with a management approach to macrovascular disease and obesity, appeared in the October issue of *Australian Family Physician*.)

Protein malnutrition

Assessment

Protein malnutrition, often considered to be a problem of underdeveloped countries, is also a clinical problem in our society. Assessment is based on the following:

- Recognising the clinical settings in which the condition may occur:
  - anorexia, either as a primary condition (seen mainly but not exclusively in young women) or secondary to a depressive state (seen mainly in elderly people) or occasionally as the consequence or side effect of drug therapy;
  - restricted diets, voluntarily entered into as part of a system of beliefs about the adequacy or otherwise of our food supply or in the pursuit of some imagined health benefits;
  - clinical conditions in which wasting occurs, such as protracted cardiac failure, chronic respiratory failure, malignancies (particularly gastrointestinal) and prolonged immobility associated with chronic arthritis;
  - alcohol abuse, where alcohol has come to replace other foods;
  - peri–operative problems in which the increased energy expenditure and stress associated with surgery is sometimes associated with a failure to resume feeding because of ileus or other peri–operative complications.
- Assessing the somatic protein store, which is found especially in muscle, and is best assessed at the bedside by the measurement of mid upper arm muscle circumference or area. Muscle wasting as a consequence of protein malnutrition can occur even in the presence of an increased fat mass, in which case the skin fold thickness will remain increased but hanging off a reduced arm muscle thickness. Sampling plasma proteins such as serum albumin or transferrin, which has a much shorter half life than albumin, allows the assessment of the visceral component of protein status. More accurate methods of assessing body composition, such as the lean body mass, the bone mass, the water content and the fat mass, are being developed and emerging in general clinical practice.
- Assessing whether there is associated energy malnutrition, by looking at the status of energy stores (fat mass).
- Defining the functional consequences of protein malnutrition, which may well de-

termine the clinical outcome for the patient. These include reduced T–cell lymphocyte function with an associated immunodeficiency. It is the link between nutritional status and immune function that accounts for the great prevalence of infection in areas where protein malnutrition is common. A range of other functional consequences occur, such as the alteration of drug metabolism within the body.

Diagnosis

The diagnostic statement that should be made about such a patient includes the following possibilities:

- protein malnutrition
- protein energy malnutrition
- protein energy malnutrition and associated specific nutrient deficiencies.

Since consuming an adequate amount of protein and energy involves consuming other nutrients, it is invariable that protein malnutrition or protein energy malnutrition is associated with other specific deficiencies such as iron or vitamin A.

Protein malnutrition may be a consequence of a condition such as small bowel syndrome, limited food supply or prolonged post–operative recovery.

Management

The management of protein malnutrition can be difficult and often requires prolonged nutritional rehabilitation. Removal of the cause, where possible, is essential — for example, reducing alcohol intake. The management of consequences such as infection proceeds alongside the nutritional management depending on the particular conditions involved. Nutritional support may require various levels of sophistication ranging from the provision of adequate amounts of food, to supplementation of food with formula feeds (eg. Isocal, Sustagen, Ensure) to the institution of enteral nutrition by nasogastric or even gastrostomy feeding. Parenteral nutrition may be required for hospital patients.

Eating disorders

Assessment

The various eating disorders represent a group of conditions that may manifest either as obesity or, through anorexia or bulimia, as protein or protein energy malnutrition. The assessment task involves the following steps:

- identify the high risk adolescent and young adult women who are excessively concerned about their weight and preoccupied with food and exercise;
- ask about recent and long term weight changes and the methods used to control weight;
- assess menstrual regularity, which is a sensitive index;
- be alert to difficulties in the family dynamics and in particular the capacity of the family to resolve conflicts or stresses — key periods such as school or university examinations can act as triggers.

Diagnosis

The diagnostic statement associated with an eating disorder may be, for example:

- anorexia nervosa with the presence of all diagnostic criteria
- restricted eating with a body mass index below 19
- binge eating in the presence of stress
- bulimia with a normal body mass index.

Management

The underlying mechanisms of these conditions involve psychosomatic and psychological disorders that need to be managed in conjunction with an expert. Areas that must be explored with the patients and their families are the correction of false concepts about the relationship between food, food components, body weight, body composition and health.

It is important to ensure that the diet during the time of rehabilitation is nutritionally adequate and the patient understands the concepts in ensuring nutritional adequacy.

Osteoporosis

Assessment

The recent public awareness about osteoporosis in older age, particularly in women, and its consequences of disability, pain and fractures, has led to an increased interest in the mechanisms that cause this condition. While hormonal mechanisms and other metabolic control factors are clearly of prime importance, the nutritional state of the individual is also significant. The assessment of an individual with osteoporosis requires the practitioner to:

- Recognise the existence of a problem, which may manifest as low back pain or as the basis of a fracture (especially wrist, vertebra or hip).
- Understand the high risk settings in which osteoporosis is found, including:
  - family history
  - female
  - low physical activity
  - possibly, and somewhat paradoxically, being lean
  - post–menopausal
  - cigarette smoking
  - alcohol abuse
  - disease states such as prolonged immobility
  - iatrogenic causes — corticosteroids remain a prime example
- Identify key nutritional factors, including:
  - low energy intake
  - low calcium intake and bioavailability — an area of great public interest (it is, of course, important to realise that not all the calcium consumed is actually absorbed)
  - high phosphate intake and a high sodium intake may be associated with increased urinary calcium excretion
  - low copper, fluoride, boron, ascorbic acid intake
  - high caffeine intake
  - compounds with an oestrogen–like

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activity, the phytoestrogens, which may well be protective in the post-menopausal state.

Diagnosis

The diagnostic statement associated with osteoporosis should include comments such as: "Nutritionally-related (with a listing of the important compounds associated with the osteoporosis in this individual), in association with a strong family history, ovarian failure and use of corticosteroids."

Management

Nutritional strategies need to be combined with other approaches such as hormone replacement therapy, and discussion of the food habits of the individual concerned. A better approach to management is prevention in individuals at high risk. This may be necessary as early as adolescence, before peak bone mass is reached, through education about appropriate food intake and physical activities.

Nutrient toxicity

One in five Australians takes some form of nutritional supplement. A high degree of awareness is required for symptoms presenting as a manifestation of nutrient toxicity. Definition of an individual's drug consumption should include an assessment of the intake of vitamin and mineral supplements and use of alternative therapies. It is important to understand the framework in which patients place food and their nutritional state. Some people see food as a path to wellbeing, a concept with which it is difficult to disagree. Nutrition, therefore, may not be uppermost in patients' minds as they approach a doctor about a specific ailment.

The various meganutrient syndromes that are now a clearly defined part of clinical practice, although rare, include:

- Copper deficiency, with its associated anaemia, in the setting of high zinc intake from supplementation. The interaction between these two cations at the gut epithelial surface leads to a deficiency of copper absorption.
- A sensory neuropathy associated with excess pyridoxine intake has been reported at levels of intake that are sometimes consumed for conditions such as premenstrual tension. The symptoms can include numbness, paraesthesias, ataxia and pain and the signs can include global sensory deficits, sensory ataxia, a positive Romberg's sign and loss of ankle reflexes and other deep tendon jerks. Weakness is an uncommon sign.
- Ascorbic acid is probably the nutrient that is most commonly consumed in megadoses. While many of its effects remain potential rather than common, diarrhoea may become clinically important and iron storage can be excessive.

Diagnosis

The diagnosis of nutrient toxicity requires a definition of the problem for which the nutrient is being taken (such as premenstrual syndrome, concern about winter colds, or the presence of acne). A statement about the nutrient likely to have caused the clinical symptoms is also required.

Management

The interest of the patient in their nutritional status should be maintained. This can be best done by counselling about food sources of nutrients rather than concentrating on individual nutrients. If a clinical condition is the reason the nutrient was being taken, other therapies should be suggested.

Concerns about cancer

Although some estimate that as many as a third of all malignancies are environmentally and nutritionally associated, specific nutritionally-related malignancies are rarely documented. A concern by an individual patient about their nutrition in relation to cancer requires further definition:

- Is the concern about the prevention of cancer, or about cure or management of a particular malignancy?
- When prevention is being sought, the kinds of foods promoted as a prudent diet with respect to cardiovascular disease are also relatively protective against major nutritionally related cancers in industrialised society (these include cancers of the lung, breast, colon and rectum, prostate and cervix).
- Where management is being sought, it is important to assess the presence of wasting, anorexia, food intake or increase in metabolic rate, which may all require different forms of nutritional support in their own right.
- It is important to assess, particularly in this context, whether alternative remedies such as food intake restriction are being used in an attempt to aid in management.

Diagnosis

This should allow a diagnostic statement about the nutritional concerns in this individual with cancer that addresses the basis of the concern, its consequences for body composition, and food intake patterns.

Management

Management will require the provision of relevant nutritional support in conjunction with other therapies. When prevention is being sought, a rational food intake plan should be encouraged.

Inherited metabolic disorders

A number of inherited metabolic disorders are nutritionally sensitive and may

be managed only by nutritional means — the classic example is phenylketonuria. There are a range of other enzyme–linked inherited disorders that can also be managed, when diagnosed early enough, by use of formulas and foods that balance nutritional needs for growth with the need to limit the intake of the potentially toxic nutrients.

Gut related metabolic disorders, such as coeliac disease, can be managed totally and successfully by the exclusion of gliadin components of wheat and other cereals from the diet. These foods are becoming widely available.

The outstanding success over the past 20 years is the management of cystic fibrosis, where survival into adulthood is now the norm. This has been associated with the adoption of clearly defined dietary guidelines for children with the disease. These include:

- breastfeeding as an infant whenever possible
- choice of a nutritious high energy diet from a wide variety of foods
- aim for normal weight for height
- eat plenty of fat, sugar and salt
- eat more breads, cereals, meats and other protein foods, and milk products
- limit alcohol consumption.

As these young adults survive longer, we may see some further consequences of this type of diet in the very long term.

Nutrient deficiency

Assessment

Nutrient deficiency rarely occurs in isolation and often results from the combination of a number of high risk situations. These situations include:

- social, economic and educational disadvantages
- restricted food intake, secondary to edentulism, stroke, severe arthritis or malabsorption
- institutionalisation
- excessive alcohol intake
- inherited metabolic disorders
- medication that promotes excretion or reduces absorption
- women of reproductive age and the very elderly
- distorted food beliefs.

It is common for several of these conditions to operate together. By taking a food history it should be possible to identify the most important 'at risk nutrients' which include, in the Australian context, thiamin, riboflavin, folic acids, vitamin B12, essential fatty acids, potassium, zinc, magnesium and selenium. This will require a knowledge of the most common food sources of these nutrients.

Where a functional test exists, such as dark adaptation for vitamin A, or haemoglobin for folic acid or B12 or iron, it should be assessed. Other laboratory investigations, such as platelet fatty acids patterns for determining recent fat intake and essential fatty acid status, may occasionally be of use.

Diagnosis

The diagnostic statement associated with nutrient deficiencies will include the type of nutrients that are deficient, the presence of a particular clinical syndrome, and the situation in which it has been expressed. As an example, 'Thiamin deficiency with the presence of Wernicke–Korsakoff psychosis on the basis of alcohol excess with a possible inherited transketolase deficiency'.

Management

The management of nutrient deficiency, in the short term, will require specific nutrient supplementation and attention to the absorptive or excretory problem. In the long term, maintenance and correction of the nutrient deficiency with food is the preferred approach, since it is common for many nutrients to be deficient together.

If long term supplementation is required, for instance in an inherited disorder, this should be in accordance with recommended daily intakes.

Diabetes mellitus

Assessment

Diabetes mellitus is distributed worldwide and will express itself in a variety of cultural settings. The usual food intake and preferences within that culture should be assessed in any individual with the condition. In this context, the identification of nutritional factors contributing to the development, expression or potential management is necessary. These include:

- energy over–nutrition
- alcohol excess
- low carbohydrate intake
- poor food variety
- large meals
- stage of life, for example, pregnancy or old age
- regularity of lifestyle, such as shift work
- cassava consumption.

Diagnosis

An appropriate diagnostic statement may be: 'Non insulin–dependent diabetes mellitus in an abdominally obese individual, with little physical activity and an Anglo–Celtic food pattern of restricted variety and considerable irregularity.'

Management

An approach to management should consider nutrient adequacy and optimal glycaemic control, aiming to minimise consequences of macrovascular and microvascular disease. A blood glucose needs to be interpreted in the context of the individual's exercise state or stress. Food intake can be adjusted by repeating the history and the food record. ❑