MALNUTRITION IN AUSTRALIAN SOCIETY

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ABSTRACT

In the face of a plentiful food supply and despite the unusually advantaged position in Australia where most food is produced close to the point of consumption, under-nutrition is still seen. In Australian hospital practice, protein energy malnutrition occurs. This is a disorder ordinarily associated with under-developed countries and the skills of nutritional assessment which allow its recognition are not part of contemporary Australian medical education. Somewhat paradoxically, it can occur in the obese. Methods of clinical nutritional assessment and the relationship between nutritional status and prognosis are areas for further investigation.

A poorly defined nutritionally related problem is that of bowel disorders in children. We have recently assessed pre-school children in the Latrobe Valley of Victoria and found that those in the upper tertile of dietary fibre intake have a prevalence of 0.2 per cent for constipation, whereas those in the lowest tertile have a prevalence of 12 per cent. Thus, for at least a third of pre-school children, there may be a significant amount of constipation related to dietary fibre deficiency. Aged persons in Australia are at risk from nutrient deficiency. As physical activity declines with age so the nutrient density of foods must increase. In addition, a proportion of elderly people are dependent on the catering system of an institution. We have found low blood levels of ascorbic acid, folic acid and zinc in institutionalised elderly people.

Minority groups might have health problems related to nutrition. Southern European migrants may have brought both favourable health patterns and food intake patterns to this country, but lose them with increasing duration of stay. Aboriginal people who move away from their traditional food supply to periurban and urban environments are vulnerable to growth retardation and infection partly for nutritional reasons.

Alcohol abuse accounts for much of the specific nutrient deficiency seen in Australia. Of growing importance are the interactions between nutrients and the numerous drugs and medications now used in medical practice.

Human nutrition problems have long been neglected in Australia, but the establishment of nutrition research groups, with adequate funding, will enable these problems to be addressed.

KEY WORDS: Under-nutrition; obesity; children; elderly; migrant; Aborigine; alcohol; drug-nutrient interactions.

I. INTRODUCTION

With a strong agricultural economy (Australian Academy of Science, 1977) and after the identification of the major nutrients, it was generally assumed that Australia had no significant human nutritional problems. Slowly, we came to realise that there were problems of overnutrition which were evident in the high prevalence of obesity, but were also contributing to excessive cardiovascular mortality.

However, the food habits, which were associated with excess energy intake over needs also came to be associated with certain types of undernutrition. The problem was, therefore, more one of "dysnutrition". The kinds of foods which characterised affluent Australian society were energy dense rather than nutrient dense. This became even more of a problem as levels of physical activity declined and the need to ensure an adequate nutrient intake from less and less food became more pressing.

An example of "dysnutrition" now seen would be the coexistence of obesity with dietary fibre deficiency manifest, in one of many ways, by constipation and haemorrhoids (Wahlqvist, *et al.* 1981). With a genetic tendency to develop diabetes, the obese, lacking fibre in their diets, will be more likely to manifest diabetes mellitus (Wahlqvist, 1980). The energy dense diet will be relatively high in fat which, together with fibre deficiency and other features, will predispose to coronary heart disease.

The obese will be pressurised to slim and will be subject in consequence to food fads which have their own risks for nutrient deficiencies.

Alcohol abuse can contribute to overnutrition by providing excess calories or energy and to undernutrition by displacing valuable foods from the diet, by interfering with absorption of nutrients and by interfering with the action of certain nutrients (Baghurst, 1980; Collins and Turner, 1978; Collins, 1980; Lewis and Rayner, 1978; National Health and Medical Research Council of Australia, 1978; Williams, *et al.* 1978).

Food is a complex system, made up of hundreds of chemical compounds beyond the fairly well described nutrients comprising protein, carbohydrate, fat, vitamins, minerals, trace elements, dietary fibre and water. It includes compounds which naturally colour and flavour food. There are also natural toxicants in foods. There are factors which alter digestion and absorption, such as enzymes and enzyme inhibitors, and there appear to be factors which may be protective against certain diseases such as indoles in certain vegetables, which may be protective against large bowel cancer. Nutrition is the business of examining the impact of food itself on health and disease. That is, it goes beyond a consideration of nutrients and concerns the foods we eat, the meals at which they are eaten, and the overall food intake patterns.

One of the reasons why we have been late in recognising the array of nutritional problems in Australia (Gracey, 1978; Hetzel and Nobile, 1979) is that we have had little information on a national let alone a local community basis about what Australians actually do eat.

II. WASTING DISEASES WITH REVERSIBLE NUTRITIONAL COMPONENTS

Modern medicine has managed to sustain life in the face of a number of disease processes. A number of diseases are associated with wasting, but that part of this process might be reversible as nutritional support has only been appreciated lately (Table 1).

TABLE 1

Wasting diseases with reversible nutritional components

1. Neoplastic disease.
2. Gastrointestinal disease:
   (1) Complications of gastrointestinal surgery such as fistulae;
   (2) Chronic inflammatory bowel disease such as Crohn's disease;
   (3) Cystic fibrosis;
   (4) Malabsorption syndromes.
3. Burns patients.
4. Mental and neurological disabilities.
5. Chronic renal failure.
6. Respiratory failure.

There are some encouraging studies which suggests that, when patients are treated for cancer by chemotherapy or radiotherapy, nutritional support will allow them to cope with these treatments better and also to have a better immune system with which to handle residual disease.

Work is now going on in the University of Queensland's Department of Paediatrics to evaluate the nutritionally reversible component of an inherited disorder affecting children, fibrocystic disease (Shepherd, unpublished).

III. GROUPS VULNERABLE TO UNDER-NUTRITION IN AUSTRALIA

Certain groups are inevitably vulnerable on account of age, or physiological circumstances, but most nutritional vulnerability in our society relates to socio-economic disadvantage, lifestyle problems, changing family structure and contemporary medical practice (Table 2).

TABLE 2

Groups vulnerable to undernutrition in Australia

1. Selected age groups:
   (1) Children
   (2) Adolescents
   (3) Women in reproductive age
   (4) Elderly
2. Specific situations:
   (1) Single persons
   (2) Single parents
   (3) Institutionalised
3. Lifestyle problems:
   (1) Physically inactive
   (2) Alcohol abusers
   (3) Cigarette smokers

4. Socio-economically disadvantaged:
   (1) Limited education
   (2) Aborigines
5. Iatrogenic:
   (1) Medications
   (2) Surgery
6. Other medical problems:
   (1) Obesity
   (2) See Table 1
7. Food faddism

Children often require energy dense foods because of growth and physical activity, but they also require nutrients including dietary fibre. We have recently found in the Latrobe Valley of Victoria, that the one third of pre-school children with the lowest intake of fibre rich foods have a 12 per cent prevalence of constipation, in contrast to the one third with the highest intake of such foods where the prevalence of constipation is less than 1 per cent (Wahlqvist, *et al.* 1981).

It has been known for many years even in industrialised societies, that women in the reproductive age group are liable to iron and folic acid deficiencies (Baker and Demaeyer, 1979; Jacobson, 1977). Women are also more conscious now of the merits of breast feeding such as the provision of immune factors not present in other forms of infant feeding (Lawson, Mays and Oliver, 1978).

Good nutrition prior to conception and in early pregnancy may also reduce certain congenital abnormalities (Baker and Demaeyer, 1979; Collins, 1980; Editorial, *Lancet*, 1980).

Those adolescents who use marijuana seem prone to, at least, folic acid and pyridoxine deficiencies (Davis, Midalia and Curnow, 1978).

A growing proportion of the Australian population is elderly and institutionalised. We have found evidence that this group in Australia is at risk from ascorbic acid, folic acid and zinc deficiencies (Flint, *et al.* 1979).

Aborigines in Australia continue to suffer from nutritional problems brought about by the advent of European settlement in Australia (Coles-Rutishauser, 1979; Gracey, 1978; Hetzel and Frith, 1976).

A number of medications can adversely affect nutritional status, but the problem can be dealt with if recognised (Roe, 1976).

At the time of major surgery, nutritional support systems are often required and newer support systems, especially tube feeding as opposed to parenteral, are becoming available.

Occasionally, people can be sensitive or allergic to components in food and these may need to be eliminated from the diet. Unfortunately, these eliminations are often made without good evidence of effect and with risks of nutrient deficiency, especially in children (Burns and Bryant, 1978). The components of food which have troubled consumers are additives, especially colourings and preservatives and also natural components such as salicylates. A more constructive approach to the problem of food sensitivity would be possible if more objective methods of assessment were available.

IV. MORE COMMON NUTRIENT DEFICIENCIES IN AUSTRALIA

TABLE 3
More common nutrient deficiencies in Australia

1. Water
2. Dietary fibre
3. Folic acid
4. Iron
5. Zinc
6. Thiamin

Water is an often forgotten nutrient in Australian food intake patterns (Table 3). It has been included in the Australian dietary guidelines (Wahlqvist, 1980). There are several reasons for this. Soft drinks and flavoured sweetened milk have become preferred drinks for children and alcoholic beverages are consumed when water would do for adults. As a consequence, several nutritionally related problems are aggravated:

(i) dental caries in children;
(ii) obesity in children and adults;
(iii) alcohol abuse;
(iv) urinary calculi.

There is growing evidence that several groups in Australia are vulnerable to zinc deficiency. These include Aboriginals, the elderly and alcohol abusers. Zinc is an important part of more than twenty metallo-enzymes, which are involved in a wide range of functions including protein synthesis, alcohol degradation and vision.

V. NUTRITIONAL RESEARCH PRIORITIES RELATING TO UNDER-NUTRITION IN AUSTRALIA

Once the nutritional problems are recognised, the research priorities are apparent (Table 4).

TABLE 4

Nutritional research priorities relating to undernutrition in Australia

1. National nutrition surveillance:
   (1) Food intake data
   (2) Nutritional status
2. Intensive study of at-risk groups to identify problems and work out solutions:
   (1) Aborigines
   (2) Children and adolescents
   (3) Pregnant women
   (4) Elderly
   (5) Alcohol abusers
3. Nutritional assessment and support systems in institutions and hospitals.
4. Drug-nutrient interactions.
5. Nutrition education for doctors and other health professionals.

There is clearly a need for national nutrition surveillance in Australia. Selected groups need careful scrutiny. There needs to be more attention to methods of nutritional assessment and nutritional support, especially in institutions and hospitals (Lawson, Mays and Oliver, 1978). In a society which depends heavily upon drug therapy for illness, the nutritional consequences of such therapy require evaluation (Roe, 1976).

Most important of all is the need for the development of a nutrition education strategy in the community. This will be directed at young and old. It will need to take into account all areas of the education system. The media in its various forms will be required. Farmers, agriculturalists and the food industry must be involved. As techniques are developed, they and their effects must be evaluated.

A long overdue requirement is adequate nutritional education for doctors and other health professionals (Wahlqvist, 1981). Without leadership on food and nutrition matters from health professionals, the public will be vulnerable to peddlers of nutrition misinformation and to "dysnutrition".

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