FAMINE IN THE MIDST OF PLENTY: NUTRITIONAL STATUS OF THE FRAIL ELDERLY

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Summary

During 1992-93 all patients were screened for nutritional problems on admission to the Anne Caudle Centre Rehabilitation Unit in an attempt to prioritise their nutritional care. Data was collected by dietitians within 72 hours of admission, largely from information available in the patient's medical record. Three hundred and sixty nine patients over 60 years of age had sufficient meaningful data available for inclusion in this study. These elderly patients were admitted either because of a recent illness, surgery or trauma; or because of declining functional status which was limiting their ability to cope in their usual environment. This paper discusses the incidence of pre-admission nutritional risk factors and indicators of poor nutritional status in this elderly population. Undernutrition was common in these patients, with major factors being the presence of disease and conditions leading to an increase in nutritional requirements or which limit intake of food, or disabilities which limit the ability to eat or independently obtain and prepare food. The Determine Checklist published by the Australian Nutrition Screening Initiative has been used retrospectively on 303 of the same group of patients to compare a score of nutritional risk with previous dietitian assessment of nutritional status. Results indicate that score of nutritional risk correlates with likelihood of undernutrition but that it is not sufficiently accurate to replace nutrition assessment by a dietitian in a high risk population.

I. INTRODUCTION

Malnutrition is reported to be common amongst elderly populations although the magnitude of the problem has not yet been accurately assessed, particularly in Australia where little data has been published. Ranges for prevalence of malnutrition in the elderly in other developed countries have been estimated (Mion et al. 1994) at 10 to 51% of community-residing elderly, 20 to 60% of the hospitalised elderly and up to 85% of nursing home patients. The recognition of the high prevalence of protein-energy malnutriton has been described (Morley 1994) as one of the major issues in geriatrics in the last five years.

The negative consequences of undernutrition in the modern hospital patient have been described by many authors in the last 20 years (Butterworth 1974; Constans et al. 1992), but the routine identification and treatment of nutritional problems are still not considered an essential part of patient care (Morley 1991). The cost of the increased morbidity due to malnutrition in the elderly is unknown. Nutrition screening is a tool which allows prioritisation of patients according to their risk of malnutrition. It is also a management tool which provides information on the extent and types of nutritional problems in a specific population. When nutrition screening leads into an intervention process it can assist in the provision of appropriate standards of care and guidelines aimed at improving patient outcome while containing health care costs. It provides objective standards to measure quality and quantity of nutrition services and provides data to analyse cost/benefit of nutrition services.

The most advanced nutrition screening system has been developed for the elderly population as a result of the work of the Nutrition Screening Initiative (NSI) (1991) in the US, with a consensus being reached on the risk factors for malnutrition in the elderly, major and

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minor indicators of poor nutritional status, and a three-tiered approach to screening which not only raises awareness of the warning signs of poor nutritional health but also identifies the person at risk of, or having poor nutritional status.

It is not known to what extent nutrition screening is being used in Australia, or to what extent tools which were validated for use in the US will need adaption for use in this country. This paper examines data collected during nutrition screening in a regional rehabilitation unit and discusses some implications of the results.

II. DATA COLLECTION

All patients admitted to the Anne Caudle Centre Rehabilitation Unit during 1992-1993 were screened for nutritional problems within 72 hours of admission. A nutrition screening form was developed to collect data believed to give the best indication of nutritional risk, and when sufficient objective data was available lead to a provisional nutrition diagnosis and enabled preparation of an appropriate plan of care.

Data was collected in seven areas:

(i) Anthropometrics Weight on admission, height, body mass index (BMI), usual weight and recent weight change. Unintentional weight loss of more than 10% usual body weight in less than six months or 5% in one month, or the presence of underweight/obesity are considered major indicators of poor nutritional status (NSI 1991). The consensus of the NSI was that a BMI <22 or >27 indicates disturbance of nutritional status in the elderly (NSI 1992).

(ii) Biochemical data When available the following were collected : total lymphocyte count, serum albumin, serum transferrin, haemoglobin, serum folate and serum vitamin B12. The interpretation of biochemical data in evaluating nutritional status is subject to much debate. However, it is generally agreed that serum albumin and serum transferrin can give an indirect assessment of the status of the visceral proteins, and total lymphocyte count is used to evaluate immune function (Shuran and Nelson 1986). Serum albumin below 35 g/l, folate and vitamin B12 deficiencies are considered major indicators of poor nutritional status in the elderly (NSI 1991).

(iii) Nutrition-related diagnosis These included diagnoses which increase nutritional requirements eg cancer, fracture, chronic obstructive airways disease; or those which can reduce the ability to consume sufficient food eg partial gastrectomy, stroke with dysphagia; or those which require diet therapy for optimal treatment.

(iv) Feeding problems Data was collected on those who required enteral feeding, those who had recently been 'nil orally' for more than five days, the presence of nausea, sore mouth, or dental problems, and when the patients were unable to feed themselves or required assistance or supervision with meals. The presence of food allergies and medically advised or self-imposed dietary restrictions were also noted. Restriction of food intake, mouth problems, dysphagia and the loss of function or independence in eating are all considered a risk factors for poor nutritional status (NSI 1991).

(v) Bowel dysfunction Constipation in the elderly can be caused by diet, medication or disease process and can lead to confusion, nausea, anorexia and both urinary and faecal incontinence. Incontinence has major implications for future care, as a nursing home may be the only option available for a person who cannot manage their own continence.

(vi) Drug-nutrient interactions Many drugs interact with nutrients and in the elderly where polypharmacology is common, and drugs are often taken for very long periods of time for chronic disease, drug-nutrient interactions may be a significant problem. Data was collected which allowed identification of those requiring more than three medications as this is considered a risk factor for poor nutritional status (NSI 1991).

(vii) Pre-admission Risk Factors Malnutrition may pre-exist the current illness and is considered more likely in those who live alone, are depressed or have memory deficits; have problems with nutrition-related activities of daily living (ADL) such as shopping, cooking, or eating; have drug or alcohol problems; or who are living in poverty. Data was collected to

enable identification of these problems so that the rehabilitation team could be alerted to the need to address these problems as part of the overall plan of care. The collection of this data has allowed estimates of the incidence of risk factors for poor nutrional status and major indicators of malnutriton in the elderly to be made

(viii) Provisional nutritional diagnosis Where possible a provisional diagnosis was made to assist in assigning a level of care. The following categories were possible:

Adequate: no evidence of nutritional problems.

Adequate but 'at risk': no current problems but placed at risk by condition increasing nutritional requirements or decreasing ability to obtain sufficient food.

Cachexia: depletion of body fat with maintenance of visceral proteins.

Visceral attrition: normal or excessive body fat stores with decreased levels of visceral proteins.

Protein-energy malnutrition (PEM): fat reserves and lean body mass are reduced, body weight is below expected range, and visceral proteins are depleted.

(ix) Plan of care The dietitian who completed the screening then assigned a level of care to each patient.

Subsequent to the collection of this data the publication of the 'Nutritional risk checklist' by the Australian Nutrition Screening Initiative (ANSI 1994) has enabled us to score 303 of these patients again and compare the risk score with an assessment of nutritional status carried out by a dietitian.

III. RESULTS

Results are reported for 369 patients admitted to the Rehabilitation Unit. Most had been previously living at home before illness, trauma or declining function necessitated their admission to hospital; less than 8% had previously been living in a nursing home. Patients were drawn from the inhabitants of one large provincial city (Bendigo) and the rural areas of the Loddon-Campaspe-Mallee region of Victoria. Most were of Anglo-saxon background, because this region has the lowest number of residents of non-English speaking background in Australia. Nearly 60% of this sample were over 80 years old, with 15.9% being 90 or over. The most common diagnoses were stroke (26%), fractures (19.5%), chronic obstructive airways disease (14%), diabetes (13.3%), decubitus ulcer (6%), infection (6%) and osteoporosis (5.7%). Multiple diagnoses are common in this population.

Table 1. Incidence of risk factors of poor nutritional status

Risk factor		%
Restricted food intake due to	-therapeutic/self imposed diet	29.0
	-food allergies	1.7
	-reduced appetite	31.9
Poverty		1.7
Social isolation		25.7
Dependency disability which could limit food intake	-unable to shop	15.3
	-unable to cook	11.5
	-need assistance to eat	7.7
	-dental problems	4.0
	dysphagia	13.1
	-sore mouth	1.1
	-nausea/vomiting	2.4
Acute chronic disease or condition		100.0
Chronic medication use		92.3
	-more than three medications	53.6
Advanced age	-80 years or over	59.3

The incidence of risk factors for poor nutritional status are given in Table 1, and the occurrence of major indicator of poor nutritional status in Table 2. A provisional nutritional diagnosis was made on the basis of available data, as set out in Table 3.

Table 2. Occurrence of major indicators of poor nutritional status

Major Indicator	%
Significant weight loss	29.1
BMI - <22	47.2
- >27	7.5
Serum albumin <35 g/l	27.1
Inappropriate food intake (omit at least one food group)	1.2
Obesity - BMI >30	5.6
Folate deficiency	2.9

Table 3. Provisional nutritional diagnosis on admission

Nutritional diagnosis	%
Adequate	13.1
Adequate but 'at risk'	24.4
Cachexia	25.7
Visceral attrition	8.3
PEM	17.3
No diagnosis made	11.2

The publication of the ANSI checklist for estimation of nutritional risk has allowed the comparison of our nutritional assessment with risk scores which would have been achieved with the ANSI checklist on 303 patients for whom sufficient information was available. A score of 0-3 was obtained for 91 patients (30%), 87 patients (28.7%) scored 4-5 and would be considered at moderate risk, and 125 patients (41.3%) scored 6 or over and so would be at high risk of poor nutritional status. Those at lowest risk were more likely to have adequate nutritional status, and those at highest risk most likely to have a nutrition disorder. However results obtained from the ANSI Checklist are not sufficiently precise to allow it to be used as a substitute for even brief nutritional assessment. The nutritional diagnosis of these risk groups is given in Table 4.

Table 4. Nutritional diagnosis obtained on admission of risk score groups

Nutritional diagnosis	Low risk %	Moderate risk %	High risk %
Adequate	25.0	17.2	4.0
Adequate but 'at risk'	34.0	27.5	32.0
Cachexia	17.5	22.9	24.8
Visceral attrition	8.8	11.5	5.6
PEM	10.9	19.5	32.0
Folate deficiency	3.2	1.1	1.6

IV. DISCUSSION

Undernutrition is common amongst this group of frail elderly, which is not surprising considering the incidence of risk factors such as advanced age, chronic and multiple medication use, and the presence of acute or chronic disease. Other major risk factors appear to be the frequency of dietary restrictions, loss of appetite, living and eating alone, an inability to shop or

cook, and dysphagia. The most common major indicators of poor nutritional status in our population are significant recent weight loss, BMI < 22, and a serum albumin < 35 g/l.

While immediate nutrition support is often needed to improve nutritional status in these patients and the dietitian will have a role in ensuring nutritional adequacy of any therapeutic diet prescribed for the elderly person a wider role is essential if we are to address the problems which can lead to poor nutritional status. Maintaining the independence of the elderly person in shopping for food and cooking may be more important than providing nutrition education. It is essential that the most appropriate intervention for the individual problem is chosen.

The ANSI checklist, which contains 12 questions that can be answered by the elderly person or those who care for them, was designed to estimate risk and educate about factors which can lead to malnutrition. It was not designed to diagnose malnutrition and this study shows that it is not sufficiently accurate to be used for this purpose. In particular it is not able to identify the person who is underweight but who has not had a recent weight loss, 17.5% of patient whose risk score was low were diagnosed with cachexia and 10.9% with PEM. However it is useful in pinpointing which factors are most important for that person and can assist in planning for individual nutritional care. In our population we can see that we need to develop more support programs which overcome the effects of acute and chronic illness on appetite and oral health, identification of drug-nutrient interactions, and innovative ways to overcome social isolation and dependency in nutrition-related ADL. The dietitian working in the area of geriatric nutrition will not be able to work in isolation to solve these problems, but will need to be part of a team including community health workers, occupational therapists, pharmacists and medical practioners.

Screening for nutritional problems may not be economically viable in a very high risk population. Only 6.4% of patients admitted to this Rehabilitation Unit were considered to not require follow-up. It is therefore more efficient to commence assessment on admission for everyone rather than screen all patients and then have to repeat much of the process for a complete assessment for a very high proportion.

Screening has, however, pointed the way to future subjects of research particularly in the areas of outcomes of early intervention in high risk/high volume groups of malnourished frail elderly.

As the numbers of the elderly increase and the costs of their health care also rise, it is important that we highlight and treat these problems of undernutrition, as well as those of overnutrition which affect so many Australians.

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