Nutritional support and stroke

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Following stroke poor nutritional status is common, under recognized and associated with worse outcomes. This article explores existing assessment and management strategies aimed at recognizing and reducing the impact of malnutrition in stroke patients.

Stroke is the leading cause of disability and the third most common cause of death in the UK (Wolfe et al, 1996). Unsurprisingly it accounts for 4% of the NHS expenditure, imposing an enormous economic burden (Wolfe et al, 1996).

There is ample evidence that poor nutrition is common in patients admitted to hospital. This is particularly true for stroke patients as their physical and psychological disabilities, high prevalence of swallowing difficulties, concomitant illness and medications challenge their ability to meet increased nutritional demands. According to a systematic review by Potter et al (1998) nutritional supplementation improves nutritional indicators and reduces the odds of death by 34% through improvements in muscle strength, wound healing and resistance to infection. This review related to older patients rather than specifically to stroke patients.

Unfortunately the most favourable fluid and feeding policy for stroke patients remains uncertain and it is currently being examined in a large, international randomized trial, the food or ordinary diet trial (FOOD), which has already recruited over 5000 patients.

The 2001/02 National Sentinel Stroke Audit (Royal College of Physicians, 2002a) found wide variations in the consistency of organization and clinical care within the participating UK hospitals. Only 64% of patients had a swallowing assessment within 24 hours, 78% had an evaluation of nutritional needs documented and less than half were weighed at least once during admission. Only 36% of admitted patients spend any time on a stroke unit, suggesting that structured stroke care programmes delivered by health professionals with a special interest and/or formal training in stroke management are not available widely.

In order to increase awareness of the hazards of under- and overnutrition, and integrate clinical nutrition into routine clinical practice and training, the British Geriatric Society (2003) and the Royal College of Physicians (2002b) have published up-to-date guidance on nutrition in elderly patients, including stroke patients.

ASSESSMENT OF AN INDIVIDUAL'S NUTRITIONAL STATUS

Brody (1997) argued that the ethical goals that define medical practice include promoting health and preventing disease, healing and curing disease, and relieving suffering caused by disease symptoms. The purpose of identifying persons at risk of malnutrition in stroke is to improve prognosis and quality of life. The national clinical guidelines for stroke (Intercollegiate Working Party for Stroke, 2004) advise that every stroke patient should have his/her nutritional status screened within 48 hours of hospital admission by appropriately trained personnel using a valid nutritional screening tool. They also advocate dietitian referral for patients with nutritional problems, including dysphagia.

History taking and physical examination should be followed by uncovering of risk factors for malnutrition, e.g. inability to feed oneself, chewing and swallowing difficulties, constipation, diarrhoea, cognitive decline, psychiatric symptoms and concomitant medical conditions. Alcohol and medication review is paramount including current use, those taken before hospital admission, prescription-only medications and over-the-counter drugs.

Assessment tools

Local nutritional assessment charts are currently used throughout the UK. They typically include no more than 10 items and can be completed in less than 5 minutes. A scoring system discriminates between a satisfactory nutritional status that requires no specific action, risk of malnutrition that calls for prompt dietitian referral plus encouragement of extra food, or high risk of malnutrition demanding immediate referral to a dietitian for further assessment and intervention.

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Guigoz et al (2002) highlight the Mini Nutritional Assessment (MNA) and the short form Mini Nutritional Assessment (American Dietetics Association, 2000) as well-validated tools that provide an early measure of the severity of malnutrition, a guide to nutritional intervention and the means to assess the effectiveness of intervention in elderly patients.

The MNA is easy to administer, patient friendly, inexpensive (no laboratory investigations are required), highly sensitive (96%), specific (98%), and reproducible. It comprises 18 items in four sections: anthropometric, general, dietary and subjective assessment. It is usually completed in less than 15 minutes when assessing healthy individuals but history taking in a stroke patient can prove challenging and may require input from carers, relatives, friends, health-care personnel and medical records.

The body mass index (BMI) predicts total adipose tissue and is calculated by dividing body weight in kilograms by the square of the height in metres. The Committee on Diet and Health (1989) considers normal BMI values to be between 22 and 27 kg/m^2.

BMI calculation may be particularly difficult in stroke patients and special equipment such as a wheelchair scale may sometimes be required. Ideally the patient should be weighed on a well-calibrated scale, wearing light clothing and without shoes. Obtaining an accurate height can also be difficult because of inability to stand erect or because of chronic illnesses that affect stature.

In addition to helping identify undernutrition a biochemical nutritional assessment helps monitor the efficacy of nutritional interventions and detects specific vitamin or mineral deficiencies. Laboratory tests must be reviewed in the context of age- and disease-related changes.

Gariballa et al (1998a) describe low serum albumin levels as highly predictive of inhospital complications, mortality, readmissions and prolonged duration of hospital stay, but changes in position from upright to recumbent and acute concomitant illnesses affect serum albumin levels, limiting their diagnostic value in acute stroke.

It is essential that throughout the nutritional assessment process the different culture, languages and needs of the individual are acknowledged.

ESTIMATING NUTRITIONAL REQUIREMENTS

The National Policy and Research Center on Nutrition and Aging (Institute of Medicine Food and Nutrition Board, 2002) has published tables which summarize current recommended dietary allowances. They can be used as general guidelines for the nutritional management of the elderly but do not account for age-related disease and concurrent medical therapy.

Basal energy expenditure can be calculated from the Harris and Benedict (1919) equation, and then multiplied by a factor for activity and the underlying disease giving an estimate of protein energy requirements. As a rule of thumb it is best to avoid excess amounts of energy in the acutely ill and aim to maintain weight in the chronically ill.

Vitamin and mineral levels can be readily measured, but one should be aware of the limitations of such determinations (Refai and Seidner, 1999).

MEETING STROKE PATIENTS' NUTRITIONAL REQUIREMENTS

The British Geriatrics Society (2003), the *National Service Framework for Older People* (Department of Health, 2001), and the revised stroke guidelines (Intercollegiate Working Party for Stroke, 2004) emphasize the need to seek early advice from dietitians and speech and language therapists to assess the most appropriate method of meeting individual nutritional requirements.

Only when the views of all members of the health-care team have been considered, perhaps at a united case conference, and the views of the patient (if possible) and family (as appropriate) are known, should an important decision be made such as to embark on enteral or parenteral feeding or conversely discontinue tube feeding.

The consent of the patient or a justifiable presumption of consent is needed before any invasive procedure is undertaken. If necessary a patient's mental capacity can be assessed according to guidance notes issued by the British Medical Association in collaboration with the Law Society (1995). Enforced tube feeding should be resorted to only when all voluntary methods of treatment have failed and health is severely impaired as a result of malnutrition.

Oral nutritional support given acutely and extended during the rehabilitation phase improves nutritional intake and prevents malnutrition in stroke patients (Gariballa et al, 1998b).

Supplementation can be also be achieved by intravenous feeding but this is rarely used or justified in patients with stroke whose gastrointestinal tract can absorb nutrients. Compared with enteral feeding, parenteral feeding fails to maintain gastrointestinal functional and structural integrity, is less physiological, more expensive and difficult to use. Complications include infection, embolism, pneumothorax, haematoma and abscess formation. Mechanical, gastrointestinal and metabolic complications of enteral feeding affect 12% of patients at 11 months (Cataldi-Betcher et al, 1983).

Access to the gut, especially in dysphagic patients, can also be achieved by nasogastric, nasointestinal, percutaneous gastric or percutaneous jejunal routes.

Nasogastric tubes are not always easy to insert and carry a higher risk of self-extubation. This adds to patient distress, interrupts any feeding regimen and may cause aspiration, as well as ulceration of the nostril if use is prolonged.

Percutaneous endoscopic gastrostomy (PEG) tube feeding is more invasive than nasogastric and has its own complications including aspiration, peritonitis, mechanical displacement, wound infection and haemorrhage. Oyogoa et al (1999) observed a 41% 30-day mortality in 100 consecutive patients with PEG placement, which is usually higher in demented patients. Chowdhury and Batey (1996) showed that as many as 40% of tube feeding-related deaths are a direct result of aspiration pneumonia. The longer tubes crossing the pylorus into the duodenum or jejunum obviate the advantage of the stomach as a reservoir, require an infusion pump, and are frequently dislodged. Other complications of enteral feeding include diarrhoea, hyperglycaemia, hypercapnoea, electrolyte abnormalities, and re-feeding syndrome. Given the high complication rate of enteral feeding, if the underlying medical condition is unlikely to be improved a supportive care plan without enteral feeding should be considered.

Clear policies for short- and long-term review of stroke patients at risk of undernutrition and access to training for all health professionals involved in their care must be at the heart of any local strategy aimed at tackling under- and over-nutrition in acute stroke. Ethnic minority individuals and the appropriate representative bodies should be involved throughout the process of review and development of local services.

CONCLUSIONS

Poor nutrition is widely prevalent and under-recognized in stroke. It leads to increased mortality, hospital stay and residential placement. Nutritional assessment in stroke is best performed through multidisciplinary evaluation at multiple levels, with patients' and relatives' involvement, and should be an integral part of clinical practice.

As most stroke patients are cared for outside stroke units it would seem sensible to raise awareness of the subject among all health professionals, encourage local training programmes and develop primary care, hospital, nursing and residential home protocols for nutritional assessment and management, which could be used as an opportunity to engage local communities. HM

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KEY POINTS

- Undernutrition is common and an independent predictor of morbidity and mortality after stroke.
- Engage the patient, all members of the multidisciplinary team, carers and relatives in decision taking.
- Acknowledge the different culture, languages, dietary preferences and needs of the individual and deliver care that is sensitive to patient needs.
- Encourage the development of primary care, hospital, nursing and residential home protocols for nutritional assessment and management and include relevant aspects of clinical nutrition in training for other health professionals.