stepwise work-up, coupled with ongoing counselling, mitigates against coercion by giving the potential donor several opportunities to bow out.

Potential problems

Dr Charles Newstead (St James' University Hospital, Leeds) had been asked by the conference's organiser to play devil's advocate to an audience with a clearly positive attitude to LDTs, and to highlight possible problems. He reminded the audience that some LDT kidneys will be lost early and that even successful ones may not last forever, so they must not be seen as a cure. But his greatest concern was quality of consent, particularly the difficulty in assessing its voluntary nature. He also referred to the potential blurring of the distinction between proper compensation and financial inducement.

Discussion

The conference ended with an open question-and-answer session, with Dr Douglas Briggs in the chair and Professor Andrew Bradley (Addenbrooke's Hospital, Cambridge) and Mr Chris Rudge (The Royal London Hospital) on the panel. The conclusion of the discussion was that living donor transplantation represents a positive and cost-effective response to the growing numbers on the waiting list for renal transplants, and deserves greater effort from health service professionals and more finance from the government.

Conclusion

The consensus of participants at this conference was broadly in favour of living donor transplants but it was felt that a more coherent national approach was needed. Indeed, the meeting itself had contributed in some way to this end. The invaluable contribution of transplant co-ordinators and counsellors was applauded, but there are not enough of them and hope was expressed that despite tight budgets new posts may be created. A joint working party of nephrologists and transplant surgeons is to be convened to address many of these issues.

Practical aspects of nutrition support

The British Association for Parenteral and Enteral Nutrition (BAPEN) was founded in 1992 in response to the recommendations of the King’s Fund report, A positive approach to nutrition as treatment and was supported from the start by a consortium of the principal industrial companies providing nutrition support and pharmacy products. It has prepared a number of working party reports and runs training courses for nutrition support professionals. This first joint conference of BAPEN and the Royal College of Physicians took place in April 1998, and underlines the increasing recognition of the role of nutrition in patient care and the development of clinical nutrition as a medical specialty with an approved training programme.

Malnutrition related to disease

Dr C R Pennington (Ninewells Hospital, Dundee) presented data on the prevalence of disease-related malnutrition (DRM) in hospital, based on a study of 500 patients in five different specialties. Forty per cent of patients were underweight and 25% suffered moderate to severe DRM, defined as body mass index (BMI) of less than 20 kg/m². Fewer than 50% of these patients had a record of their nutritional status in their case notes and 75% of those with DRM continued to lose weight while in hospital. In some of these patients their malnutrition may have got worse because they missed some meals or could not eat what they had been given.

The difficulty of separating the effects of disease from those of undernutrition was repeatedly raised in discussion at this conference. The better progress of those patients whose DRM was recognised and treated supports the view that the effects of disease itself on DRM may often be reversed with nutritional support.

Dr J Edington (Abbott Laboratories, Maidenhead) had assessed the prevalence of DRM, in liaison with the MRC epidemiology centre in Southampton, in 474 patients with cancer, 2,959 with chronic diseases and 123 post-surgical patients in the community. DRM was more common in people in the lower social classes, in those under 65 years of age, and in women. Patients with chronic disease and DRM were more likely to suffer from apathy and those with cancer and DRM from chronic pain. Dr Edington also found that the rates of consultations, prescriptions, hospital admissions and mortality were all higher in underweight patients.

Rapporteur: Crawford JAMIESON mrcp, Specialist Registrar in Gastroenterology and Nutrition [King George Hospital, Goodmayes, Essex]
than in those with a BMI in the normal range. This is the first study comparing undernutrition with morbidity in a UK community and again raises the problem of separating effects of the severity of active disease from those of undernutrition.

Dr S P Allison (University Hospital, Nottingham) described the effects of DRM on clinical outcome. Pure starvation in the absence of pre-existing disease, as in the IRA Maze prison hunger strike, resulted in progressive disability after a weight loss of 5–15%, with a 30% mortality at 40% weight loss. Keys et al\(^4\) observed normal individuals during a 24 week semi-starvation period, followed by 24 weeks of refeeding. There was a mean weight loss of 24%, associated with marked increases in depression and reductions in many physiological functions. Allison's group\(^5\) found that the greater the severity of DRM in patients admitted with fractured neck of femur, the longer they took to achieve independent mobility. Chandra\(^6\) demonstrated widespread impairment of immune function which worsened as the nutritional state deteriorated. The undernourished elderly have difficulty in regulating their core body temperature under cooling stress and are more likely to sustain a fractured neck of femur in cold weather. The effects of severe undernutrition were studied by physicians in the Warsaw ghetto in the Second World War. Malnutrition in excess of 30% of weight loss was associated with a reduction in the ability to excrete a salt and water load. Oedema is commonly observed in hospital practice in malnourished patients, especially if they have been given excess saline. Tucker et al, in a study that specifically aimed to separate the effects of disease from those due to undernutrition in inpatients with DRM by the allocation of disease severity scores, calculated that 40% of morbidity was accounted for by disease activity and 20% by undernutrition\(^7\). This study was seen as most important in the definition of nutrition itself as an independent clinical variable.

Another area that fired debate throughout the meeting concerns the possible benefits of nutrition support in those who do not yet suffer DRM (ie BMI <20kg/m\(^2\)) but who have been eating less than usual. Jeejeebho\(^y\)\(^8\) showed that muscle function was impaired before there was any measurable loss of lean body mass and that it could be restored with an adequate food intake. Beier-Holgerson and Boeby\(^9\) showed clinical benefits from early postoperative feeding of patients not suffering DRM. The effects of food on both gut permeability and bacterial translocation may also be important here\(^10\).

**Does nutritional support improve clinical outcome?**

Dr D B Silk (Chairman of BAPEN, Central Middlesex Hospital, London), discussing the effects of oral supplements and enteral tube feeds, emphasised the importance of studying these in defined groups of patients with similar disease activity. Delmi et al\(^11\) showed that sipfeed supplements were of benefit in patients with DRM and fractured neck of femur. As in the tube feed study of Bastow and Rawlings\(^3\), morbidity was reduced in the first admitting hospital and the rehabilitation hospital, and continued for the first six months after discharge. Silk and co-workers\(^12\) found that giving sipfeeds in moderately to severely undernourished patients after gastrointestinal surgery not only did not reduce their standard dietary intake but actually increased it, whereas in the control group weight loss was greater, wound infections more frequent and fatigue more severe. Grip strength fell only in the control group. By reducing postoperative morbidity and shortening a patient's stay in hospital, tube feeding can save up to $3,500 per patient admission\(^11,13\). However, there were no differences in energy or protein intakes or well-being scores between tube fed patients and controls.

Dr J J Shaffer (Hope Hospital, Salford) considered intestinal failure to be the only real indication for parenteral feeding and that therefore many comparisons between enteral and parenteral feeding may have little relevance to clinical practice. A comparison of enteral and parenteral feeds in postoperative patients found both approaches to have similar nutritional efficacy, but parenteral feeding had a higher complication rate which was not accounted for simply by catheter-related sepsis. On the other hand, a separate study found that patients fed parenterally had fewer complications than did control subjects, ie that parenteral feeding is preferable to starvation.

The indications for using home parenteral nutrition (HPN) vary considerably between the UK and mainland Europe. In Europe, as in the USA, the majority of patients on HPN have cancer, while this is only a small group in UK practice, where Crohn's disease is the most common indication. BAPEN recommends that if a hospital wants to offer an HPN service, it should have a nutrition support team, a training programme, and appropriate hospital and community liaison with adequate support care. Catheter sepsis is the most frequent complication of both HPN and hospital total parenteral nutrition (TPN), and it is well documented that hospitals without a dedicated nutrition support team have a higher rate of line sepsis.

Quality of life scores (QoL) have been used to assess the experiences of patients receiving HPN. These scores are highest for patients on HPN for Crohn's disease, poor for elderly patients and very poor for those with coincident difficulties of opiate dependency. HPN costs approximately £45,000 for the first year of feeding and £34,000 for each subsequent year, but this is still about 60–80% cheaper than the inpatient care of such patients. Survival of patients on HPN is longest for those with Crohn's disease, shorter for those with malignancy and much shorter for those with HIV disease. Ethical considerations become important when HPN is considered in those with predictable poor long-term survival.

This presentation sparked a vigorous debate on the standards of many of the enteral versus parenteral feed trials. In many studies patients in the enteral and parenteral groups
received different levels of nutrition support. There is increasing consensus that parenteral feeding offers no greater benefits than enteral feeding when both routes are available, and that complications of parenteral feeding relate significantly to bacterial translocation in the gut in subjects not given any food by mouth. Dr Silk recommended that whenever possible patients should take some food by mouth.

Areas of controversy

Mr R Wilson (King’s College Hospital, London) spoke about the use of and difficulties relating to percutaneous endoscopically placed gastrostomy (PEG) feeding. Patients discharged from hospital with PEG feeding require complex care packages, training and supplies. There is a particular need for close liaison between hospital and GP, feed supplier, district nurse, nursing or residential home and local social services. GPs naturally find a lack of consultation a problem for patients who depend on tube feeding. The provision of good community care for the increasing number of tube-fed patients poses a considerable challenge for nutrition support units.

Dr J Powell-Tuck (Royal London Hospital, Whitechapel, London) explained the role of glutamine supplementation in artificial feeding. This five-carbon amino acid makes up just 5% of structural protein but 50% of the free amino acid pool, especially in the muscular compartment. Metabolic stress results in the outpouring of glutamine from peripheral compartments into the circulation. Glutamine is an important source of fuel for the gut and is used for gluconeogenesis in the liver. It contributes to some extent to acid-base homoeostasis by the inter-organ transfer of ammonia. Glutamine is also a source of fuel for lymphocytes, and is involved in nucleic acid synthesis, cerebral neurotransmitter formation and in the maintenance of intracellular hydration. The net uptake and release of glutamine is about 23.5 g daily and total body turnover may reach 60–140 g daily. Six to eight per cent of dietary protein is glutamine; protein-based enteral feeds typically provide 5.2–8.1 g glutamine per day, and peptide-based feeds provide 1.3–5.6 g/day. Until recently, TPN has not included any glutamine because of problems with keeping it stable in solution but this has now been overcome and there are commercially available feeds containing both free glutamine and glutamine dipeptide. Glutamine is not an essential amino acid but becomes conditionally essential at times of metabolic stress.

The action of glutamine occurs predominantly in the small bowel and colon, with little glutaminase activity in the stomach and oesophagus; it is not surprising that glutamine supplementation does not appear to affect the severity of chemotherapy-induced mucositis. Glutamine/glutamine dipeptide in TPN can reduce mucosal atrophy and prevent the usual increase in the lactulose/mannitol absorption ratio observed in TPN patients who are not given any

Dr C Green (Nutricia Corporate Research, Zoetermeer, The Netherlands) discussed the role of perioperative nutrition support. Patients generally have an intake of less than 1,000 kcal/day for two to three days after abdominal surgery and approximately 10% of patients are malnourished after major surgery. Reduced intake in the absence of established protein energy undernutrition may be clinically important. Studies assessing the effects of preoperative nutrition on clinical outcome have yielded inconsistent results, but there is emerging evidence that the clinical outcome is worse for patients who had been fasting before the onset of disease-related malnutrition. This early evidence, if supported in further clinical studies, will have a large impact on the provision of nutrients, especially in perioperative patients. This led to the speculation that there might be functional thresholds of nutrient provision below which physiological impairment occurs, even after quite brief interruption of nutrient provision.

Dr M Elia (MRC Dunn Clinical Nutrition Centre, Cambridge) presented the findings of the British Artificial Nutrition Survey (BANS). In this national survey, hospitals voluntarily return data concerning nutrition support practice in the form of a standard questionnaire. The aim is to audit current practice in order to improve patient care. The 1997 survey showed that home enteral tube feeding (HETF) was twice as common as tube feeding in hospital. If the current annual increase in HETF continues, more than 12,000 patients will be tube fed in the year 2000 (5,779 in 1997). The mean age of patients on HETF is 75 years, many of them having suffered a cerebrovascular event. Among younger patients there is a peak at 40 years for those with multiple sclerosis. The above diagnoses, together with oropharyngeal cancer and motor neurone disease, account for 80% of all HETF. In contrast to patients on home parenteral nutrition (HPN), many on HETF are severely disabled; 40% are unable to walk and 39% unable to talk. There are significant regional differences in the provision of HETF, probably related to differences in policy as to which patients should receive this support. The great increase in HETF in UK practice will require appropriate follow-up and it was suggested that the Department of Health might introduce the compulsory registration of patients receiving HETF and that the BANS survey might assist in the provision of HETF.

Professor J E Lennard-Jones (President, Digestive Disorders Foundation) spoke of the ethical issues that must be
considered when providing clinical nutrition support. The basic care of a patient must include the provision of fluid to drink and food to eat. But administering hydration and food by tube is considered to be a form of a medical treatment (US Supreme Court 1990, UK House of Lords 1993). Medical treatment should only be commenced if there is a clinical goal, which may, at the start of that treatment, be defined as a time-limited trial of therapy. Treatment should be withdrawn if it becomes futile or if it becomes a burden to the patient, exceeding any benefit. Medical treatment is a partnership between patient and carer. The doctor acts with the patient's informed consent, but should consult with other carers before informing patients of the treatment options.

The assessment of a patient's competence is a challenging area, and competence may vary from moment to moment. Competence requires patients to understand the potential for benefit and adverse effects, and that there is a free choice; and to be able to communicate their decision. Decisions made on behalf of incompetent patients should be made in light of their known opinions and beliefs and also take into account any advance wishes they may have expressed. Relatives are not able to act as proxy in the UK. The doctor must make decisions in the patient's 'best interests'.

It is the duty of carers to maintain the comfort and dignity of the dying, yet not unnecessarily to prolong the process. A persistent vegetative state is a borderline between life and death. The diagnosis requires prolonged observation, the opinions of relatives and carers and detailed expert assessment. The Tony Bland case demonstrated that legal opinion would support the withdrawal of feeding if this is judged to be futile. Previously stated opinions of the patient are helpful. The situation of a patient who drinks inadequately can be challenging. One might accept the deficit, or intervene with artificial fluid support. If fluids are provided, this decision should be reviewed in the manner discussed already for nutrient support.

Particular ethical dilemmas exist in the cases of neonatal injuries, childhood intestinal failure, persistent vegetative state, stroke and dementia. Anorexia nervosa is also a difficult area where specialist experience is vital. Difficulties sometimes arise when patients and their relatives have particular religious beliefs. Good communication with relatives to prevent a confrontational situation is important in avoiding unnecessary legal action.

Conclusions

This first joint conference of BAPEN and the Royal College of Physicians was an important event for the developing multidisciplinary specialty of clinical nutrition. Many new and old issues were discussed. The most prominent new development was perhaps the gathering evidence that the interruption of nutrient intake in the absence of disease-related malnutrition is of clinical significance.

References

1. Lennard-Jones JE. A positive approach to nutrition as treatment. London: King's Fund, 1992.
2. Howard J, Bruce J, Powell-Tuck J. Nutrition support; a course for developing multidisciplinary clinical teams. J R Soc Med 1997;90:675–8.
3. McWhirter JP, Pennington CR. Incidence and recognition of malnutrition in hospital. Br Med J 1994;308:945–8.
4. Keys A, Brozek J, Henschel A, Michelson O, et al. The biology of human starvation. University of Minnesota Press, 1950: vol 1:703–48, vol 2:819–918.
5. Bastow MD, Rawlings J, Allison SP. Benefits of supplementary tube feeding after fractured neck of femur: a randomized controlled trial. Br Med J 1983;287:1589–92.
6. Chandra R. Effect of vitamin and trace-element supplementation on immune responses and infection in elderly subjects. Lancet 1992;340:1124–7.
7. Tucker HN, Miguel SG. Cost containment through nutrition intervention. Nutrition Reviews 1996;54:111–21.
8. Jeejeebhoy K. Bulk or bounce — the object of nutritional support? J Parent Ent Nutr 1988;12:539–49.
9. Beier-Holgersen R, Boesby S. Influence of postoperative enteral nutrition on post-surgical infections. Gut 1996;39:833–5.
10. Elia M, Goren A, Behrens R, Barber RW, Neale G. Effect of total starvation and very low calorie diets on intestinal permeability in man. Clin Sci 1987;73:205–10.
11. Delmi M, Rapin C-H, Bengoa J, Delmas P, et al. Dietary supplementation in elderly patients with fractured neck of femur. Lancet 1992;335:1013–6.
12. Keele A, Bray M, Emery P, Duncan H, Silk D. Two phase randomised controlled trial of postoperative enteral nutrition on post-surgical infections. Gut 1997;40:293–9.
13. Rana S, Bray J, Menzies-Gow N. Short term benefits of post-operative oral dietary supplements in surgical patients. Clin Nutr 1992;11:337–44.
14. Hardy G, Wiggins D, McElroy B, Thompson G. Formulation of a glutamine containing total parenteral nutrition mixture for clinical use. Proc Nutr Soc 1992;51:136A.
15. van den Hurst RWJ, van Kreekl BK, von Meyendorf MHE, Bruummer RJ, et al. Glutamine and the preservation of gut integrity. Lancet 1993;341:1363–5.
16. O'Riordain MG, Fearon KC, Ross JA, Rogers P, et al. Glutamine-supplemented total parenteral nutrition enhances T-lymphocyte response in surgical patients undergoing colorectal resection. Ann Surg 1994;220:212–21.
17. Morlion BJ, Siedhoff HP, Furst P, Puchstein C. Total parenteral nutrition with glutamine dipeptide (L-alanine-L-glutamine) after major abdominal surgery: a randomized, double-blind controlled study. Clin Nutr 1996;15(suppl 1):48.
18. Ziegler TR, Young LS, Benfell K, Schetlinga M, et al. Clinical and metabolic efficacy of glutamine-supplemented parenteral nutrition after bone marrow transplantation. A randomized, double-blind, controlled study. Ann Intern Med 1992;116:621–8.
19. Schloerb P, Amare M. Total parenteral nutrition with glutamine in bone marrow transplantation and other clinical applications (a randomized, double-blind study). J Parent Ent Nutr 1993;17:407–13.
20. Bozetti F. Effects of artificial nutrition on the nutritional status of cancer patients. J Parent Ent Nutr 1989;13:406–20.