during erythropoietin therapy [6]. These results have not been confirmed by another controlled study [7].

Favourable effects with electrical needle stimulation, ketotifen, which is a mast-cell stabilizer, and topical capsaicin, which would deplete the pruritogenic substance P in peripheral sensory neurons have been reported. These trials have been conducted on very small numbers of patients and need to be confirmed by further studies.

Waiting for more intensive investigations on this orphan symptom we suggest the following approach. First the pruritic patient should be evaluated by a dermatologist to rule out any cause of itching other than uraemia. Then the adequacy of dialysis should be carefully checked. It is a common experience that pruritus is more frequent in underdialysed patients and may improve by increasing the efficacy of dialysis. The calcium—phosphorus product should be kept as low as a possible to avoid microprecipitations that can irritate the skin. Adequate measures should be taken to treat severe hyperparathyroidism. In well-dialysed patients without specific skin disease or severe hyperparathyroidism, we suggest starting with UVB phototherapy. Nicergoline (30 mg q. day per os) may be offered to the few non-responders. Electrical needle stimulation, ketotifen (1–2 mg b.day) or topical capsaicin can be considered as possible alternatives. Last but not least the nephrologist should be aware that many itching states have a psychological background. A number of these cases may be improved or even cured simply by listening to the problems of the patient in warm and cordial conversations.

References

Identifying the high-risk dialysis patient: what are the benefits?

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Introduction

Contemporary patients receiving renal replacement therapy (RRT) in Europe bear little resemblance to those given treatment up to the mid 1980s. As recently as 1984 a study from the UK [1] showed that some nephrologists considered blindness, dementia, and inability to speak English as reasons for exclusion from RRT! With improvements in the technology of dialysis, better immunosuppression for transplants, and an ageing population the criteria for acceptance of patients for RRT have broadened. At the same time increased awareness of the availability of a life-saving technology has led to an increase in demand by patients, their relatives, and society for RRT. As a result the number of patients on RRT in Europe has more than doubled in the last decade (from 71 000 in 1981 to 168 000 in 1992) [2,3]; the annual acceptance rate for treatment is rising rapidly in all developed countries and is now over 200/million per year in the USA. Nephrologists in many parts of the world, therefore, have become increasingly familiar with the medical, social and economic problems of dealing with high risk patients who have a poor prognosis, such as the elderly and those with severe comorbid illness.

Identifying the high-risk patient

How, therefore, can such high-risk patients with renal failure be identified? Various predictors correlate with increased risk of mortality.

Comorbidity and age

Retrospective studies using risk stratification methods have identified ischaemic heart disease, diabetes mellitus, and peripheral vascular disease as major comorbidity factors that increase risk of mortality. Using a simple risk stratification method based on age and comorbidity [4] we showed in two Scottish renal units that an overall 2-year survival of 60% masked a range
of survival from 90% in the low-risk group (age <70 years with no comorbid illness) to 35% for the high-risk patients (age >80 years, or diabetes with one comorbid illness, or any age with 2 or more comorbid illnesses or visceral malignancy). In a study supported by the BIOMED-1 initiative of the Commission of European Communities application of the same risk stratification on a wider scale to 1407 patients in seven European dialysis units (unpublished) also successfully predicted survival (Figure 1). Furthermore multivariate analysis confirmed that risk group was the strongest predictor of mortality. Medium-risk patients had a hazard ratio of 3.8 (95% CI, 2.7–5.4) and high-risk patients 6.2 (95% CI, 4.2–9.1) compared with a reference group of low-risk patients. Less than 20% of patients in the medium- and high-risk groups were in these groups because of age. Comorbidity and to a lesser extent age, therefore, are major predictors of mortality. For example, a patient aged 69 with no comorbid illness (low-risk group) has a better probability of survival on RRT than a diabetic aged 40 with ischaemic heart disease in addition to renal failure (high-risk group). This major influence of comorbidity has been confirmed in other retrospective studies [5]. Such studies, however, have the disadvantage of observer bias and potential omission of occult disease; prospective studies would avoid these problems.

**Nutrition and adequacy of dialysis**

In a recent retrospective study [6] of over 13 000 patients on haemodialysis Owen et al. showed that a urea reduction ratio (URR) of less than 55% was associated with an increased risk of death (odds ratio 1.39) compared with a URR of over 65%. Serum albumin, however, was an even more powerful predictor of mortality; patients with an albumin of less than 30 g/l were seven times more likely to die within the 6 month follow-up period than those with a serum albumin of greater than 40 g/l. Although these figures were adjusted for age, sex, race, primary renal disease, and the presence of diabetes, the influence of vascular disease and other comorbid illness was not considered. Such data, however, do not indicate whether a low URR and low albumin concentrations are a cause or a consequence of morbidity. There is a need, therefore, for well-designed interventional studies addressing the combined influences of comorbidity, nutrition and dialysis adequacy on survival.

**Mode of presentation for RRT**

The predialysis phase of patients with ESRD may be an important determinant of risk for the patient receiving RRT. There is evidence that presentation with advanced renal failure and lack of prepared access for dialysis may have adverse influences on patient survival [7]. Prospective studies are needed to answer the important but hitherto neglected question of when patients should be referred to a nephrologist. Retrospective studies indicate that high risk patients who might benefit from early referral tend either not to be referred or to be referred late to nephrologists [8,9].

**What are the benefits of identifying the high risk patient?**

Consumers and purchasers increasingly demand evidence of effectiveness in all areas of health care. The recent publication of ‘league tables’ comparing mortality from myocardial infarction in Scottish regions illustrates this trend. The use of such crude data as performance indicators, however, has been heavily criticized, and were such methods to be applied to RRT the results would be meaningless if the proportion of patients at high risk was not considered. In addition patients who die within a few weeks of commencing dialysis may be recorded by some centres and not by others and such differences in reporting may further invalidate comparison of survival data. This is particularly relevant when comparing European data with those from the United States as the United States Renal Data System excludes patients dying in the first 90 days [10]. A major benefit, therefore, of identifying the high-risk patient and at the same time developing uniform methods of data collection is the ability to compare accurately the effectiveness of RRT both nationally and internationally.

The increase in numbers of patients on RRT has been accompanied by a decline in overall survival; since 1979 gross annual mortality in the USA has risen from 20 to 24% [11]. The effectiveness of treatment of those under 70 years of age with no comorbid illness, the type of patients treated 16 years ago, has improved, with 4 year survival at around 90% (Figure 1); the crude overall (4 year) survival was, however, 60%. Hence the value of grouping patients according to prognosis and avoiding crude statistics is that it allows consumers and purchasers to have a clear perception...
of the effectiveness of RRT and relate conclusions on outcome measures to specific groups of patients. Moreover it focuses attention on those patients at high risk who are likely to require increased health service resource.

Such benefits to health planning will ultimately lead to improved care of those at high risk. There are, however, more immediate benefits to nephrologists and their patients. Development of scoring systems based on mortality risk will enable the nephrologist to present a realistic prognosis to an individual patient and his or her relatives. Furthermore, it will allow identification of the characteristics associated with a particularly poor outcome such that withdrawal of dialysis, now the second most frequent cause of death among dialysis patients in North America [12], can be carefully managed and in some cases anticipated. A further aim of identifying factors which place patients on RRT at increased risk must be to intervene and modify them in order to improve the outcome of our patients.

Conclusion

The identification of those at high risk, therefore, has benefits for the patient, their relatives, nephrologists, and those who plan health care. Multicentre international studies such as the collaborative study described above supported by the Biomed programme of the Commission of the European Communities have identified such patients and focused on their needs. Further prospective studies of survival are required to allow accurate comparison of performance among centres along with interventional studies to address both the influence of patient related factors such as comorbidity and treatment related factors including nutritional status and dialysis adequacy on outcomes including survival and quality of life in large groups of patients. In the early days of RRT the challenge to nephrologists was to be able to overcome technical difficulties and provide safe treatment for more patients on RRT; this challenge has largely been met. With the prospect of rationing in health care [13] the more difficult task as we enter the next millenium is to provide high quality care for the large heterogeneous group of patients on RRT. There is an urgent need to improve the lot of many of those at high risk and to be able to identify those patients for whom RRT serves merely to prolong death.

References


Advantages and limits of the jugular catheter approach

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Introduction

Existing blood access methods for haemodialysis may be divided into two broad categories: (1) subcutaneous, which require punctures for each dialysis, and (2) transcutaneous, which permanently penetrate the skin.

The simplest blood access from the subcutaneous category is a large vein entered with a semirigid catheter, which is removed after one dialysis. This method is used mainly for acute haemodialysis. If the catheter is left for a few dialyses, it may be considered a hybrid