

SECTION I: Evaluation, selection and preparation of the potential transplant recipient

I.1 Epidemiological data concerning end-stage renal failure (ESRF) and its treatment in Europe

Guideline

A. In estimating the number of patients in need of renal transplantation, one should integrate the basic epidemiological data concerning end-stage renal failure (ESRF), and in particular the currently linear increase of the point prevalence by ~7.5% each year. (Evidence level B)

Commentary on Guideline I.1: Epidemiological data concerning end-stage renal failure (ESRF) and its treatment in Europe

Guideline A. The incidence of new patients with ESRF during 1996 was 118 per million population (pmp) for the European Union, which currently includes 15 countries with a total population of 373.3 million (response rate=88%) corresponding to 44 140 new patients per annum.

The death rate from ESRF during 1996 was 69 pmp for the EU, corresponding to 25 830 deaths per annum.

On 31st December 1996, the prevalence of live ESRF Patients was 655 pmp for the EU, corresponding to 244 508 patients on dialysis.

The dynamics were as follows [1,2,3]:

- Flow-in rate of new patients: $K_i = +18.1\%$ of the active pool.
- Flow-out rate (crude death rate): $K_o = -10.6\%$ of the active pool.
- Linear increase for 1996 compared with 1995: $+7.5\%$ or $+49$ pmp [4].

These 244 508 live patients were treated either by haemodialysis (140 812; 57.6%), peritoneal dialysis (20 390; 8.3%) or with a transplant (83 305; 34.1%).

The number of renal transplants performed during 1996 in the EU was 11 333, (30.4 pmp). The highest activity was for Spain with 1707 (43.4 pmp) and Austria with 362 (44.7 pmp).

There is a large disparity between countries belonging to the EU, but an even greater disparity between countries outside the EU. Comparison between the EU and the USA is given in Table I.1 for 1996.

Clearly, the demand for renal transplantation far

Table I.1. Epidemiological data concerning end-stage renal failure (ESRF) during 1996

	EU ^a	USA ^b	Units
Population	373.3	272.7	millions
Response rate	88	93	%
New patients:			
Ni (in)	44 140	78 592	number
Ni/P (incidence)	118	288	pmp
Ki (Ni/Ns)	+18.1	+25.7	%
Dead patients:			
No (out)	25 830	55 658	number
No/P (incidence)	69	204	pmp
Ko (No/Ns)	-10.6	-18.2	%
Live patients:			
Ns (stock)	244 508	305 303	number
Ns/P (point prevalence)	655	1120	pmp
K [(Ni-No)/Ns]	+7.5	+7.5	%
Modalities of treatment:			
Ns HD	140 812	190 814	number
Haemodialysis	57.6	62.5	%
Ns PD	20 390	30 225	number
Peritoneal dialysis	8.3	9.9	%
Ns Tx	83 305	84 264	number
Functioning transplant	34.1	27.6	%
Transplant activity:			
N Tx	11 333	12 238	number
N Tx/P	30.4	44.9	pmp

Ni, new patients; P, population; Ki, input rate; No, dead patients; Ko, output (death) rate; Ns, live patients in stock; K, linear increase rate in the stock of patients; HD, Haemodialysis; PD, peritoneal dialysis; Tx, renal transplantation.

^aERA Registry Report (Madrid, Sept 99).

^bUSRDS 1998 Report.

exceeds the availability. Every effort should be made to increase the number of donors, but the solution may reside in xenotransplantation with modified pigs as donors.

References

1. Berthoux F, Jones E, Gellert R, Mendel S, Saker L, Briggs D. Epidemiological data of treated end-stage renal failure in the European Union (EU) during the year 1995: report of the European Renal Association Registry and the National Registries. *Nephrol Dial Transplant* 1999; 14: 2332–2342
2. Berthoux FC. Evaluation of epidemiological data by model analysis: perspectives for the ERA-EDTA registry. *Nephrol Dial Transplant* 1996; 11: 771–772
3. Berthoux FC, Jones EH, Mehls O, Valderrabano F. Transplantation Report. 3: annual end-stage renal disease (ESRD). Demography and treatment: application of a mathematic model based on the compartment (kinetic) theory. The

EDTA-ERA Registry. European Dialysis and Transplant Association-European Renal Association. *Nephrol Dial Transplant* 1996; 11: 44–47

4. Briggs JD, Berthoux F, Jones E. Predictions for future growth of ESRD prevalence. *Kidney Int* 2000; 57: S46–S48

I.2 General evaluation

Guidelines

A. All patients with end-stage renal disease (ESRD) should be considered for renal transplantation unless they have absolute contra-indications, because renal transplantation offers a better life expectancy and quality of life than dialysis.

(Evidence level A)

B. Long duration of dialysis, previous incidence of recurrent infections, cancer, cardiovascular disease or gastrointestinal complications should not be considered as absolute contra-indications to renal transplantation, despite these conditions increasing the risk of post-transplant morbidity and mortality.

(Evidence level B)

C. Psychological evaluation of transplant candidates may be useful in assessing compliance with future immunosuppressive treatment. Poor compliance significantly worsens the outcome of renal allografts.

(Evidence level B)

Commentary on Guideline I.2: General evaluation

Guideline A. Although dialysis once offered a greater chance of survival than transplantation, particularly in the short term, recent studies have reported a lower risk of mortality among renal transplant recipients vs dialysis patients. UNOS data reveal that despite the increased risk of death in the early post-transplant period, the 1-year mortality rate of transplant recipients was 59–67% lower, depending on the degree of HLA compatibility, than that of dialysis patients remaining on the waiting list [1]. A long-term follow-up study also confirmed the lower mortality rate associated with transplantation vs dialysis: adopting a hazard rate of 1.0 for age, gender and underlying disease for patients on the waiting list, the relative risk of mortality at 8 years post-transplant was 0.31 for transplanted patients [2].

Guideline B. The history of the transplant candidate is very important. Previous chronic or recurrent infections, cancer, gastrointestinal complications, viral hepatitis, myocardial infarction and/or lower limb arteriopathy does not always represent an absolute contra-indication to transplantation, but they indicate the need for a particularly careful work-up. Long duration dialysis is an independent variable associated with poorer long-term results [3] and increased mortality [4]. These patients therefore require a thorough investigation, particularly of the cardiovascular system.

Patients with a long history of uncontrolled hypertension have a greater risk of cardiovascular disease.

The renal history should focus on the diagnosis and duration of the original renal disease. Correct diagnosis is important to evaluate the possible risk of recurrent disease. Some patients, for example those with vasculitis, lupus, rapidly progressive nephritis or previous transplantation, will have received vigorous or prolonged immunosuppressive treatments. In such cases renal transplantation may be postponed for several months after starting dialysis, and immunosuppressive agents may be stopped or reduced to avoid the risk of over-immunosuppression.

A general screening examination should be conducted following the interview. Attention must be paid to the exit site of any peritoneal catheter or to the arteriovenous fistula, which represent potential sites of infection. In patients with adult polycystic kidney disease, the size of the kidneys should be evaluated to determine whether or not a nephrectomy is required.

As well as cardiac auscultation, murmurs of carotid arteries, aorta or lower limb arteries should be investigated. Physical examination should include palpation of the prostate in men and a gynaecological examination in women.

Guideline C. The use of psychiatric screening in transplantation is not universally adopted, despite the fact that many transplant candidates have active psychiatric disorders, psychiatric pre-disposition, psychiatric symptoms or a history of substance abuse, and require psychiatric attention [5]. An important aim of the psychological evaluation is to predict patient compliance with post-transplant treatment care. Poor compliance is common [6] and is one of the most frequent causes of graft loss [7]. Patients with a history of attempted suicide, with prior medical non-compliance, psychosis, inadequate neurocognitive functions, or alcohol or drug abuse are poor candidates for transplantation [8]. With the exception of a few cases of absolute non-compliance, which almost inevitably leads to graft failure, ~22% of patients take some but not all the prescribed drugs. Even in these cases, late rejection episodes eventually leading to graft loss may occur [9].

References

1. Edwards EB, Bennett LE, Cecka JM. Effect of HLA matching on the relative risk of mortality for kidney recipients: a comparison of the mortality risk after transplant to the mortality risk of remaining on the waiting list. *Transplantation* 1997; 64: 1274–1277
2. Schnuelle P, Lorenz D, Trede M, Van Der Woude FJ. Impact of renal cadaveric transplantation on survival in end-stage renal failure: evidence for reduced mortality risk compared with hemodialysis during long-term follow-up. *J Am Soc Nephrol* 1998; 9: 2135–2141
3. Montagnino G, Tarantino A, Cesana B *et al.* Prognostic factors of long-term allograft survival in 632 CyA-treated recipients of a primary renal transplant *Transpl Int* 1997; 10: 268–275
4. Cosio FG, Alamir A, Yim S *et al.* Patient survival after renal transplantation: I. The impact of dialysis pre-transplant. *Kidney Int* 1998; 53: 767–772
5. De Geest S, Borgermans L, Gemoets H *et al.* Incidence, determin-