Chapter 10: Listing for Renal Transplantation

This chapter was written in collaboration with UK Transplant and the British Transplantation Society.

Summary

This is a joint analysis of data held by UK Transplant and the Renal Registry.

The time to listing for transplantation, and factors relating to this, were analysed in 4944 patients (2602 <65 years), from 34 renal units throughout the UK, who started renal replacement therapy during 1998 or 1999.

Factors that significantly affected whether a patient was listed for transplant were: age ($p<0.0001$), primary renal disease ($p<0.0001$), and the size of the renal unit ($p=0.0001$), with large units listing patients more quickly.

Gender and ethnicity of the patient and whether the dialysis hospital also has a transplant unit were not found to have a significant effect.

Of the 2602 patients aged 18-64 years, 1110 (43%) were listed for transplantation within one year, 1347 (52%) within two years and 1406 (54%) by 2½ years. This compares with 3%, 4% and 5%, respectively, of those aged >64 years.

Pre-emptive listing (listing before dialysis) occurred in 21% of adults under 35 years old, only 4% of adults aged 55-64, and vary rarely in those over 65.

The chance of a patient less than 65 years old on dialysis being listed for transplant varied significantly between primary renal disease groups. It was as low for diabetes as renal vascular disease, and best for those with polycystic kidney disease and glomerulonephritis.

Larger renal units were more likely to list patients than smaller ones ($p<0.0001$), and had higher rates of pre-emptive listing for transplantation.

Introduction

This work was carried out as a joint project with UK Transplant. Data have been analysed only for those centres on both the Renal Registry and the UK Transplant databases. UK Transplant holds the waiting list, recipient tissue typing data and donor information for patients waiting for, or having received, a renal transplant in the UK. Linking this data with the pre-transplant history, post-transplant failure data, and quarterly biochemistry and blood pressure data, collected by the Renal Registry provides a unique database.

It is possible to analyse the whole Renal Replacement Therapy history of patients from participating centres in a longitudinal manner, and relate this to the events around renal transplantation. The first such analyses were presented in the 2000 report. With more centres joining the Registry it is anticipated that it will shortly be possible to develop substantially more detailed and comprehensive analyses for joint publication.

This chapter examines factors related to access to the national waiting list for renal transplantation.

Listing for transplantation

Figure 10.1, originally produced in the 2000 Registry Report, indicates that at any one time the majority of dialysis patients are not on the national transplant waiting list. Even in the 18-24 age group, 35% of dialysis patients are not registered on the national transplant waiting list. The time taken for new patients to be registered on the waiting list from first starting dialysis may significantly influence these data.

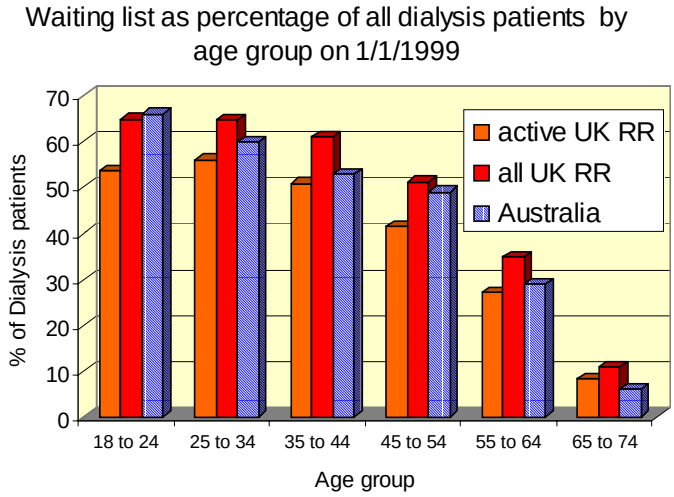

Figure 10.1: Waiting lists as a percentage of all dialysis patients

Figure 10.1 only includes data from centres on the UK Renal Registry and is therefore an approximation for the UK. Patients listed for transplantation before needing dialysis but not yet dialysing were not included. The "all UK RR" numbers include those patients temporarily suspended from the waiting list. The Australian data, taken from the ANZDATA report, excludes suspended patients (personal communication).

Patients studied and statistical methods

The Renal Registry, covering approximately 50% of the UK, reported 4944 patients (2602 <65 years) starting their first renal replacement therapy during 1998 or 1999. The databases of UK Transplant and the UK Renal Registry have been linked to obtain a unique dataset comprising data for 4944 adult renal dialysis patients and their associated listing dates where applicable. Using these data, the aim of this study was to investigate factors that influence whether a patient is listed for renal transplant on the national waiting list.

Patients were from 34 dialysis units throughout the UK, 17 of which were also transplant centres. Factors included in the analysis were age at start of renal replacement therapy, primary disease, gender, ethnicity, and for the renal units renal replacement therapy

prevalence rate and whether the renal unit has its own attached transplant service. Separate multifactorial logistic models were developed for patients aged less than 65 years and patients aged 65 years or older for the binary outcome listed/not listed. Cox's proportional hazards regression models were fitted to analyse the combined effect of these factors.

Factors influencing listing for transplantation

Factors that significantly affected whether a patient was listed for transplant were: age ($p<0.0001$), primary renal disease ($p<0.0001$), and the size of the renal unit ($p=0.0001$). Gender and ethnicity of the patient and whether the dialysis hospital also has a transplant unit were not found to have a significant effect.

Age

To analyse the effect of age on the time from starting renal replacement therapy to listing on the active transplant waiting list, Kaplan-Meier survival curves were constructed for patients grouped by age (see figure 10.2). Patients who died were censored at time of death. Those who were listed before starting dialysis were included with a time to listing of 0 days.

Age was a major factor in determining the speed of listing for transplantation (figure 10.2). As expected, the percentage of patients listed decreased with increasing age over 34 years ($p<0.0001$), and listing took longer. Of the 2602 patients aged 18-64 years, 1110 (43%) were listed for transplantation within one year, 1347 (52%) within two years and 1406 (54%) by 2½ years. This compares with 3%, 4% and 5%, respectively, of those aged >64 years. Multifactorial analysis of the 2342 patients aged 65 or older showed primary disease and age to be significant.

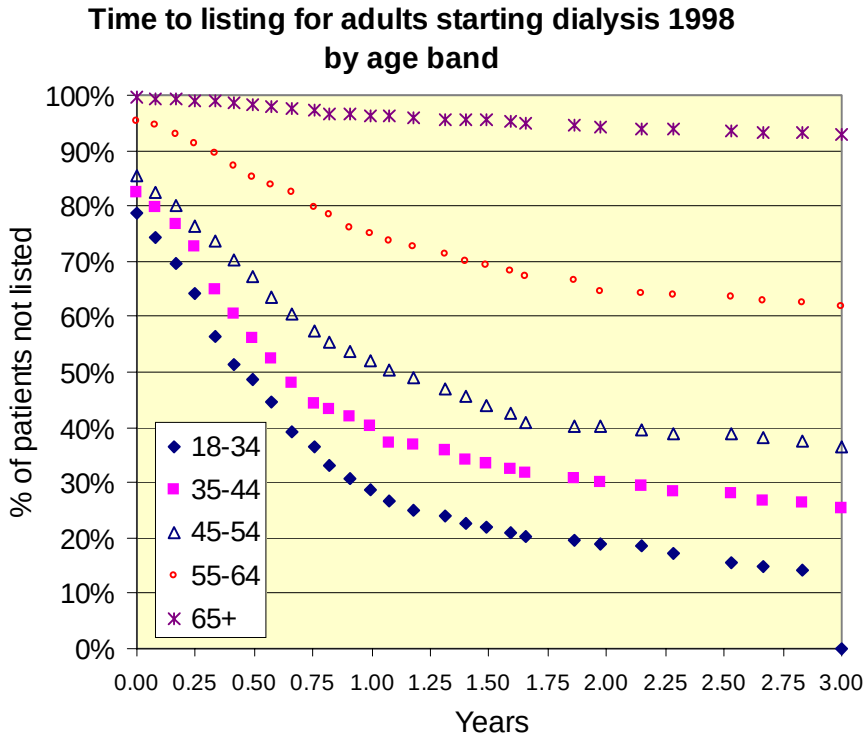

Figure 10.2: Time to listing for adult patients.

Of patients aged 18-34, 21% were pre-emptively listed for transplantation, by age 55-64 this had fallen to 4%, and was very rare in those over 65.

There appeared to be long delays in listing patients. The proportions in each age group finally listed by the time of this analysis were (in ascending age order) 86%, 75%, 77%, 42%, and 9%. In the 55-64 year old age group delays in listing for transplantation may be due to the need to investigate co-morbidity, particularly cardio-vascular disease and fitness for operation. This is unlikely to explain the delays in listing the younger patients.

Primary renal disease

Age-adjusted results for the primary disease groups are shown in table 10.1:

Primary disease	No. of patients starting dialysis	Relative chance of listing	95% confidence interval	P value
Aetiology uncertain/GN not proven (baseline)	470	1.0		
Glomerulonephritis (GN)	349	1.7	1.2 – 2.3	0.002
Pyelonephritis	242	1.3	0.9 – 1.9	0.1
Diabetes	540	0.3	0.2 - 0.4	<0.0001
Renal Vascular Disease	78	0.3	0.2 – 0.6	0.0001
Hypertension	122	1.4	0.9 – 2.1	0.2
Polycystic kidneys	237	3.0	2.0 – 4.3	<0.0001
Other	360	0.3	0.2 - 0.4	<0.0001
Not reported	204	0.4	0.2 - 0.6	0.0001

Table 10.1: Primary renal disease and listing for transplantation – age adjusted.

The chance of a patient less than 65 years old on dialysis being listed for transplant varied significantly between primary renal disease groups. It was low for diabetes and renal vascular disease, and highest for those with polycystic kidney disease and glomerulonephritis.

Characteristics of the renal unit

It initially appeared that patients were more likely to be listed pre-emptively, and more quickly in renal units which were also transplant units. However, further analysis showed this to be related to the size of the renal unit, especially with regard to the number of patients under 65, and not to the presence of a transplant centre. Larger renal units were more likely to list patients than smaller ones ($p<0.0001$), and had higher rates of pre-emptive listing for transplantation (without preceding dialysis). The reason why larger renal units list more patients and list them more quickly are unclear. Whether this is due to pressure on dialysis facilities, more active clinical management, or other factors requires investigation.

Future audit

The reasons for the variations in time to listing need further understanding. Centre by centre analysis of the pre-dialysis work up for transplantation, and time to listing, show wide variation between centres and could form the basis of useful comparative audit of the performance and effectiveness of different renal units.