Editorial Comments

Has the rise in the incidence of renal replacement therapy in developed countries come to an end?

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Introduction

In their 2006 annual data report, the USRDS reported that after years of considerable growth, the rate of new patients taken into renal replacement therapy (RRT) has begun to decrease slightly. Between 2002 and 2004, the overall incidence rate adjusted for age and sex declined by 1.1% to reach 339 per million population (pmp). This decline included a reduction in the incidence rate of RRT for diabetic ESRD of 2.1% to 149 pmp, over the same period. While the incidence rate in the white population had not changed since 2002, there was a decrease in the black, Native American and Asian patients of 4.0%, 5.5% and 8%, respectively [1]. However, subgroup analysis showed that the US incidence rates had decreased in females, but not in males. Furthermore, the continuing rise in diabetic ESRD rates for black patients, aged 30–39 years remained a cause for concern. Nevertheless, the data suggested at least a stabilization of the RRT incidence rate in the US and this is an observation of great interest. Indeed, until recently, many researchers predicted a continuing rise in the RRT incidence rate of as high as 5–8% per year in the more developed countries [2,3].

Europe

Similar trends of stabilization of incidence rates in some European countries were reported for the first time at the Congress of the European Renal Association-European Dialysis and Transplant Association (ERA-EDTA) in Lisbon in 2004 [4]. Recent further analysis of the data, from registries collecting complete individual patient data over the period 2000–2004, yielded adjusted incidence rates in Northern and Southern Europe, as shown in Figure 1. Over this period, the ERA-EDTA Registry had full coverage of Northern Europe for these registries, with the exception of Germany. For comparison, we therefore added data derived from the 2005–2006 German Registry report [5]. For Southern Europe, the ERA-EDTA Registry further included all registries that sent 2000–2004 data with complete coverage of their own area. However, for Southern Europe the geographical coverage was more limited.

Figure 1 shows that, on average, the incidence rates in Northern Europe have stabilized at around 110 pmp. Over this period, the incidence rate of RRT for diabetic ESRD was also constant, at around 24 pmp (data not shown). Subgroup analysis showed that the trends in overall incidence rates since 2002 were different across age groups, including no change in the 0–19 and 20–44 age groups and a decrease in the 45–64 and 65–74 age groups of 6.1% and 3.4%, respectively. There was, however, an increase of 8.4% in patients over 75 years of age.

In contrast, the overall incidence rates in Southern Europe have continued to rise since 2002, with an increase of 8.8% to 129 pmp and with a rise in RRT for diabetic ESRD of 12.4% to 28 pmp in 2004. The incidence rates in Southern Europe were higher than in the northern part of the continent across all age groups. Up to the age of 64 years, the incidence rates have remained stable since 2002, but in the 65–74 and the 75+ age groups there were increases of 8.4 and 16.2%.

The Southern European incidence rates were, however, not as high as the ones in Germany, where the incidence rates, having risen 11.7% to 194 pmp since 2002, were among the highest in Europe. Part of this difference was due to RRT for diabetic ESRD which accounted in Germany for 66 pmp in 2004, an extremely high rate, compared to other European countries.

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Other registries

In Australia and New Zealand, there were respective reductions in the incidence rates of 2.1% to 95 pmp and of 7.6% to 110 pmp in 2004 [6]. The Canadian Registry on the other hand, reported a stabilization of the incidence rate at around 158 pmp, after 2002 [7]. In Japan however, the incidence rate of dialysis, still showed a modest increase of 4.3% over the period, 2002–2004 [1].

Factors affecting the incidence of RRT

The incidence of RRT is the outcome of a complex interplay of many factors that have effects in different directions. Let us first consider the number of patients developing ESRD. This number will, among other factors, be affected by the age and gender distribution in the general population, by the prevalence of underlying causes of ESRD, by the access to and quality of health care and by survival from so-called competing risk.

The incidence rates within the ERA-EDTA Registry and the USRDS were adjusted for the age and sex distribution of the general population, thus any trends in these rates cannot be due to changes in those factors. Also for the other registries, it is highly unlikely that any decrease in incidence rates could be explained by such changes, as virtually all general populations are ageing.

Regarding the prevalence of underlying causes of ESRD in the general population, most information is available on the prevalence of diabetes mellitus. Both types of diabetes have been increasing in the community [8–12]. From this perspective, it is of interest that the Centers of Disease Control recently reported a decrease in the prevalence of diabetes mellitus in the US general population, after peaking to more than 7% in 2003 [1]. To our knowledge, information on similar declines in other countries is lacking. Any changes in the prevalence of diabetes in the general population would, however, affect incidence rates of RRT for diabetic ESRD, only with a delay of quite a number of years.

Incidence rates of RRT may also be affected by the quality of health care, as appropriate treatment may prevent or slow down further progression of renal failure. The results from the study by Hallan et al. [13] may act as an example of this possibility. These authors have recently shown that the prevalence of chronic kidney disease is very similar in the US and in Norway. Their findings were striking, as the incidence rate of RRT in US whites is more than twice that in Norway. Taken together, this suggested a slower progression to ESRD in Norway than in the US. After investigating a number of potential causes for this difference, the authors suggested that the better pre-dialysis care in Norway might partly explain their findings [13]. Such better secondary prevention of
the progression of renal failure has also been proposed as an explanation for the decrease in incidence rates in patients up to 64 years of age, which was already apparent some years before 2002 [14].

As a result of the successful prevention of mortality due to other diseases which comprise a so-called ‘competing risk’ for the development of ESRD, more people in the general population live longer and are consequently longer at risk for ESRD. Muntner et al. [15] have investigated this relationship and found that in the US, the increasing number of RRT patients was explained to a limited extent by the improved survival after myocardial infarction and stroke. To our knowledge, there are no indications that the decrease in cardiovascular mortality in the general population has come to a stop. The longer survival as a result of reduced competing risk is therefore inconsistent with the current stabilization or decrease in RRT incidence rates.

Another factor that must be considered is that once patients have developed ESRD, they may or may not be taken into RRT and among registries, the acceptance to RRT, or should we say, the restriction of access to RRT, is a much debated subject. As a result of the current trends in incidence rates some might speculate that, given the past dramatic rise in the incidence of RRT and the limits of resources available for health care, national health authorities or doctors may nowadays play some unintentional or even intentional role in the restriction of access to RRT. This explanation seems, however, less likely, given the continuing increase in the incidence of RRT in the older age groups. Nevertheless, with our current knowledge, we cannot confirm or reject such a hypothesis.

Conclusion

In this article we have described recent trends in the incidence rates of RRT for some developed countries. In a number of those countries, the incidence rates stabilized or even declined. In addition, we have discussed the fact that a number of factors influencing the incidence rate of RRT work in different directions. Given the limits of available data, at least in Europe, it is difficult or even impossible to predict the long term trend in the incidence rates of RRT. Nevertheless, our understanding of trends would be improved by considering all CKD stage 5 patients, instead of ‘only’ those on RRT in renal registries. In this respect, we agree with our colleagues Stengel and Couchoud [16]. Complete data on all CKD stage 5 patients are currently unavailable.

The positive news is that, at least at present, it seems that in many age groups, secondary prevention may be proving effective at the population level. If despite this prevention, patients do reach CKD stage 5, they should be offered high quality RRT.

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**References**