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Original Investigation

Factors Influencing the Decision to Start Renal Replacement Therapy: Results of a Survey Among European Nephrologists

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Background: Little is known about the criteria nephrologists use in the decision of when to start renal replacement therapy (RRT) in early referred adult patients. We evaluated opinions of European nephrologists on the decision for when to start RRT.

Study Design: European web-based survey.

Predictors: Patient presentations described as uncomplicated patients, patients with unfavorable clinical and unfavorable social conditions, or patients with specific clinical, social, and logistical factors.

Setting & Participants: Nephrologists from 11 European countries.

Outcomes & Measurements: We studied opinions of European nephrologists about the influence of clinical, social, and logistical factors on decision making regarding when to start RRT, reflecting practices in place in 2009. Questions included target levels of kidney function at the start of RRT and factors accelerating or postponing RRT initiation. Using linear regression, we studied determinants of target estimated glomerular filtration rate (eGFR) at the start of RRT.

Results: We received 433 completed surveys. The median target eGFR selected to start RRT in uncomplicated patients was 10.0 (25th-75th percentile, 8.0-10.0) mL/min/1.73 m^2. Level of excretory kidney function was considered the most important factor in decision making regarding uncomplicated patients (selected by 54% of respondents); in patients with unfavorable clinical versus social conditions, this factor was selected by 24% versus 32%, respectively. Acute clinical factors such as life-threatening hyperkalemia refractory to medical therapy (100%) and uremic pericarditis (98%) elicited a preference for an immediate start, whereas patient preference (69%) and vascular dementia (66%) postponed the start. Higher target eGFRs were reported by respondents from high- versus low-RRT-incidence countries (10.4 [95% CI, 9.9-10.9] vs 9.1 mL/min/1.73 m^2) and from for-profit versus not-for-profit centers (10.1 [95% CI, 9.5-10.7] vs 9.5 mL/min/1.73 m^2).

Limitations: We were unable to calculate the exact response rate and examined opinions rather than practice for 433 nephrologists.

Conclusions: Only for uncomplicated patients did half the nephrologists consider excretory kidney function as the most important factor. Future studies should assess the weight of each factor affecting decision making.
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INDEX WORDS: Renal replacement therapy; dialysis start; end-stage renal disease; opinions; glomerular filtration rate (GFR).

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Patients with end-stage renal disease (ESRD) receive renal replacement therapy (RRT) to improve their survival and quality of life. The decision of when to start RRT is likely to be guided by the level and rate of decrease in residual kidney function and the clinical condition of the patient. Whereas RRT might be life-saving in certain conditions, dialysis also is unphysiologic and may have life-threatening complications. It carries a significant burden for patients and consumes substantial health care resources.[1] Many studies evaluating associations between the timing of the start of RRT and survival were limited in that they considered only serum creatinine level, which is decreased in patients with deteriorating nutritional status, as a surrogate marker of residual kidney function and an index to define "early" versus "late" starters. In addition, they were unable to assess clinical status or specific reasons to start RRT at a particular moment in time.[2-5]

The IDEAL (Initiating Dialysis Early and Late) trial was the first randomized controlled trial attempting to assess whether starting dialysis therapy at high (10-14 mL/min/1.73 m^2) or low (5-7 mL/min/1.73 m^2) estimated glomerular filtration rates (eGFRs) is more beneficial with respect to patient survival. However, 76% of patients randomly assigned to start at low eGFRs actually started at higher levels because of uremic signs and symptoms, resulting in a relatively small difference in eGFRs between the groups.[6] The study failed to show a survival difference between those randomly assigned to start dialysis therapy with higher and lower eGFRs, possibly because of this relatively small difference, but suggested that clinical status is important in the decision making of nephrologists.[6-8] Nevertheless, little is known about exactly which criteria nephrologists use in their decision for when to start dialysis therapy.

Better understanding of nephrologists' decision making regarding the start of RRT would assist further studies relating residual kidney function and signs and symptoms at the start of dialysis therapy to prognosis. This ultimately would guide us to define better care for patients with ESRD. We aimed to evaluate current opinions on how clinical, social, and logistical factors influence the decision of when to start RRT in early referred adult patients by performing a survey of European nephrologists. Furthermore, we assessed whether opinions differed by nephrologists' or facilities' characteristics.

METHODS

Contents of the Survey

We developed a 26-item web-based survey using the online tool SurveyMonkey (SurveyMonkey.com). The survey was in English and contained multiple-choice and open-ended questions about the assessment method and target level of kidney function in relation to the start of RRT, factors bringing forward or postponing the start of RRT, factors causing a delay in the planned start, and nephrologists' and facilities' characteristics. The survey was administered in autumn 2010, but all respondents were asked to provide their opinions and clinical practice in place in 2009, before publication of the IDEAL trial.[6] In addition, we asked whether opinions had changed between 2009 and the moment of survey completion.

Clarity and face validity of the survey content were tested during a pilot study of 20 nephrologists from France, Italy, the Netherlands, and the United Kingdom. Based on the feedback obtained, we added questions about reasons for delay of the planned start and whether opinions changed in the recent past. A copy of the survey is provided as Item S1 (available as online supplementary material).

Design

Through national representatives and national societies of nephrology of 11 European countries, we distributed the survey along with a cover letter by e-mail to all nephrologists in the country for whom an e-mail address was available. Four weeks later, we sent a reminder to nonresponders and those who partially completed the survey. Two weeks thereafter, another reminder was sent, together with an e-mail from the national representative stressing the importance of this survey. Survey completion was voluntary and invitations included the option to decline: those opting out were not contacted further. Responses were collected and analyzed anonymously.

Definitions

In scenarios presented to nephrologists we used the following definitions. Uncomplicated patients were defined as those without malnutrition/inflammation (wasting), fluid overload, hyperkalemia, or major comorbid conditions. Examples of unfavorable clinical conditions were defined as including malnutrition/inflammation (wasting), fluid overload, hyperkalemia, mental disorders, or major comorbid conditions. Examples of unfavorable social conditions were defined as including a lack of social support, living alone or incapable to perform exchanges themselves (peritoneal dialysis), treatment nonadherence, or language barriers.

Data Processing and Analysis

The completed surveys were downloaded and stored and subsequently analyzed using SPSS version 16.0 (SPSS Inc, www.spss.com). We applied descriptive statistics and calculated median (25th-75th percentile) values and minimum-maximum ranges for skewed data. Associations were tested using χ^2 tests, t tests, and Mann-Whitney U tests. With univariable and multivariable linear regression, we studied associations between nephrologists' (age, sex, and residency in a low- or high-RRT-incidence country) and facility characteristics (academic vs nonacademic, private vs public, and for-profit vs not-for-profit centers) and eGFR at the start of dialysis therapy. Countries were classified as low or high incidence when the age- and sex-adjusted RRT incidence per million population (at day 91 after starting RRT) was lower or higher than the median of participating countries as extracted from the 2008 Annual Report of the ERA-EDTA (European Renal Association-European Dialysis and Transplant Association) Registry.[9] To fulfil criteria for linear regression analysis, we log-transformed eGFR values. For easier interpretation, we added the intercept to the estimated β coefficient and consequently transformed this back to obtain median eGFRs. We adjusted the models for factors fulfilling criteria for confounding, obtaining adjusted eGFRs.[10] Potential