ORIGINAL ARTICLE

A national survey on the decision-making process of dialysis initiation in elderly patients

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ABSTRACT

Background: The decision-making process of dialysis initiation in the elderly involves different considerations compared with younger patients. Cognitive, functional and psychosocial issues are likely to be more important than standard prognostic factors. To assess the role of these issues in the decision-making process regarding dialysis initiation in the elderly, a survey was conducted among nephrologists in the Netherlands.

Methods: An internet-based survey was sent to all members of the Netherlands Federation of Nephrology.

Results: Out of 298 invited, 94 Dutch nephrologists responded to the questionnaire. Reaching consensus with the patient and relatives and early withdrawal are difficult issues in the decision-making process in elderly end-stage renal disease patients. Geriatric impairments were considered (very) relevant issues (varying from 7-10 on a scale from 1-10) in the context of dialysis initiation, with cognitive dysfunction being most relevant (median 10, range 6-10). The majority of nephrologists (56%) underlined the need for screening for geriatric problems when considering dialysis in the elderly. A total of 26% reported using some form of screening measurement for the determination of the presence of one or more geriatric impairments.

Conclusions: Although cognitive, functional and psychosocial issues are considered relevant items in the context of dialysis initiation in the elderly, systematic assessment of these items is not standard of care in nephrology practice. Future research is needed to determine whether a more systematic screening for the presence of geriatric impairments can improve the decision-making process.

KEYWORDS

Decision-making, dialysis, elderly, end stage kidney disease, frailty

INTRODUCTION

The process of decision-making concerning dialysis initiation in the elderly is complex and hard to capture in protocols. In elderly patients, bridging to transplantation is usually not an option and prolonging of life must therefore be carefully weighed against the expected quality of life on chronic dialysis. In the last decennium, increasing attention has been drawn to conservative care as an acceptable alternative in selected elderly patients with end-stage renal disease (ESRD).[1-3] The Renal Physicians Association and the American Society of Nephrology proposed forgoing dialysis in patients with a very poor prognosis, including those with high comorbidity, severely impaired functional status and severe malnutrition.[4] However, in elderly patients without these contraindications, the decision-making process of commencing dialysis remains challenging. Elderly patients treated with conservative therapy may spend less time in hospital compared with elderly patients receiving dialysis therapy and they are more likely to die at home or in a hospice instead of in a hospital compared with dialysis patients.[5] Although age has been included in prognostic models in dialysis patients,[2] other studies found that age per se was not associated with early mortality or withdrawal in the elderly.[6] Elderly patients may exhibit more comorbidities, and the prevalence of functional and cognitive impairments in this group is high.[5,7,8] Frailty,[9]

cognitive impairment,[10] comorbidities[11] and impaired mobility[12] have been shown to be of prognostic value for early mortality and hospitalisation in the dialysis population. Despite the growing proportion of older dialysis patients, few studies have focused specifically on their prognostic relevance in the elderly population.

In oncology, assessment of geriatric impairments, such as cognition, mobility, (instrumental) activities of daily living (ADL), mood, nutrition, comorbidities and social environment, before the start of therapy can aid in identifying patients at risk for chemotherapy-related toxicity[13] and postoperative complications in surgical oncology.[14] A systematic review showed that in six studies focusing on the effect of geriatric evaluation in decision-making in oncology, such a geriatric evaluation changed the initial treatment decisions in a median of 39% of patients. In approximately two-thirds of patients this resulted in a more conservative treatment plan.[15] A questionnaire among oncologists and oncology nursing specialists in the Netherlands revealed that geriatric evaluation was used in two-thirds of participants, although often not systematically due to a lack of time, or limited availability of geriatricians.[16]

Little is known about nephrologists' considerations in the decision-making process of dialysis initiation in the elderly. Previous surveys among nephrologists revealed that patient preference, the presence of severe conditions, vascular dementia and a poor physical functioning were important determinants in deciding to withhold dialysis.[17,18] To what extent other frequently encountered geriatric problems such as mood disturbances, ADL impairment, frailty and (mild) cognitive impairment influence the decision-making of nephrologists is not known. For this reason, a survey was conducted to assess whether these issues are evaluated systematically before dialysis initiation and whether nephrologists would consider further evaluation in the elderly supportive in the decision-making process.

SUBJECTS AND METHODS

An internet-based anonymous questionnaire for nephrologists was developed, focusing on the main issues related to initiation of dialysis in elderly patients derived from clinical practice and the literature.[17-20] The survey consisted of 25 questions (Appendix) about decision-making itself and the potential role of a geriatric assessment in this process. Data were collected on characteristics of the responding nephrologists, including years of experience and facility type, and demographics of the dialysis population. The survey took about 15 minutes to complete. In February 2014, all members of the Netherlands Federation of Nephrology (NfN), 298 nephrologists in total, were requested by email to respond to the questionnaire. With only a few exceptions, all registered nephrologists in the Netherlands are members of the NfN. No fee was paid to respondents. All responses were entered into SPSS statistical package version 22 (IBM SPSS Data Collection, Chicago, Illinois, USA). To compare for differences between groups, a Student's t-test was used for continuous variables; for nominal variables, the chi-square test was used. For not normally distributed variables a Mann-Whitney U test was used. All other results are presented as descriptive data.

RESULTS

Characteristics

A total of 94 nephrologists from the Netherlands filled out the questionnaire (response rate 32%). All types of dialysis care facilities (university hospital, (non) teaching hospital, commercial dialysis centre), from all regions of the country were represented. The mean age of the participants was 47 years (33-65 years). The characteristics of respondents and their dialysis population are presented in *table 1*. One-third of the respondents estimated that the majority of their prevalent dialysis patients are over 70 years of age. Of all ESRD patients over 70 years, respondents estimated that a median of 80% (range 10-100%) would eventually start renal replacement therapy; 40% of respondents had started dialysis in one or more nonagenarians. Mean age of the dialysis population did not differ significantly between facility type and region.

Decision-making concerning dialysis in the elderly

Opinions about the level of difficulty of decision-making concerning dialysis in the elderly differed widely (median score 4 (range 1-10) on a scale from 1-10). The process of decision-making almost always included consultation of a multidisciplinary team, consisting of a nephrologist, a specialised nurse, a social worker and a dietician (95%). In some clinics a psychologist, a spiritual worker or a pharmacist complemented the team. In 8% a geriatrician was involved on a regular or a consultative basis. When dialysis was considered unfavourable because of a poor prognosis, only 11% of nephrologists estimated that older patients would always accept the recommendations of the nephrology team for conservative care instead of renal replacement therapy, while 9% experienced elderly patients often insisted on starting dialysis despite a contrary recommendation.

Different strategies were chosen in a hypothetical case of a frail older patient, in whom dialysis initiation was considered unfavourable, but no agreement could be reached about conservative therapy. Six percent of the nephrologists would initiate dialysis, since the patient and family made a well-informed choice for this option. Ten

Table 1. *Baseline characteristics*

	Total (n = 94)
Age of nephrologist in years (median)	47 (range 33-65)
Female sex	42%
Years registered as a nephrologist (median)	12 (range 1-32)
Facility type	
University hospital	21%
Large hospital (> 600 beds)	38%
Average size hospital (400-600 beds)	25%
Small hospital (< 400 beds)	13%
Dialysis centre	3%
Amount of patients over 70 years old	
21-40%	12%
41-60%	36%
61-80%	25%
81-100%	3%
Predominance of elderly patients* (> 60%) per facility type	
University hospital	9%
Large hospital (> 600 beds)	48%
Average size hospital (400-600 beds)	26%
Small hospital (< 400 beds)	45%
Dialysis centre	50%
Elderly ESRD patients* starting renal replacement therapy (median)	80% (10-100)
Elderly ESRD patients* choosing conservative care (median)	10% (0-70)
Initiation of RRT when conservative care was advised in elderly patients	
Never	11%
Seldom	56%
Sometimes	24%
Often	9%
Oldest patient starting dialysis (median)	89 (range 79-96)
Percentage of nephrologist who had started RRT in nonagenarians	48%
	*Elderly patients: > 70 years old

ESRD = end-stage renal disease; RRT = renal replacement therapy.

percent would refuse to start dialysis, regardless of the patient's wishes, since dialysis might be harmful in this frail patient. Most respondents remained unconvinced of either option. They would consult colleagues (42%) or initiate a dialysis test session for 1-3 months (37%) before making a decision in this particular case. Five percent of nephrologists would consult a geriatrician.

Of all respondents, 64% estimated that within their own dialysis population early withdrawal (within 6 months) had occurred at least once in an elderly patient (*table 2*). The main reasons for withdrawal were lack of improvement in quality of life (30%) or decline of the general condition (24%). Less often mentioned were progression of comorbidities or newly diagnosed comorbidities (19%) or technical problems involving dialysis treatment (13%). In 9% of cases withdrawal occurred after a time-limited trial. Other reasons for early withdrawal are listed in *table 2*. In 77% of the cases of early withdrawal, this was not unexpected to the nephrologist involved. The most frequently mentioned reason for starting dialysis despite hesitations was the inability to reach consensus with the patient and/or relatives to choose maximum conservative management.

Factors included in dialysis decisions in elderly patients

Geriatric impairment was considered a (very) relevant issue and was always taken into account by nephrologists when deciding whether a patient would be eligible for dialysis (*figure 1*). On a scale from 1 (not important at all) to 10 (very important), cognitive impairment scored a median of 10 (range 6-10). Preference of the patient and family (median 10 (range 3-10)) and comorbidities (median 9, (range 5-10)) were also considered (very) relevant in decision-making by almost all respondents. Most nephrologists answered that they take into account impairments in activities of daily living (ADL) (median score 8, (range 2-10)), mood disturbances (median 7, (range 2-10)) and mobility impairment (median 7, (range 1-10)). The patients' age was

also considered relevant in decision-making, with a median score of 7 (range 1-10).

As reflected by the wide range, the opinions regarding these geriatric impairments and age were divided. Caregiver burden (median 6, (range 1-10)) was considered least relevant. In a fictive case of a frail elderly patient considering dialysis, age was considered less relevant than cognitive impairment, comorbidity and ADL impairment. Decision-making seemed to be most difficult for patients aged 76-90 years (median 4 (range 1-10)), and easier for younger and older patients (median 3 (range 1-10)). Yet, the differences per age category are small and the ranges are wide (*figure 2*). The wide range is most distinct in the youngest and the oldest age category, due to the fact that some physicians consider decision-making more difficult with ascending age (40%), whereas others (30%) considered it less difficult when patients get older. We could not explain those different patterns by age of the nephrologist, years of experience and type of dialysis facility.

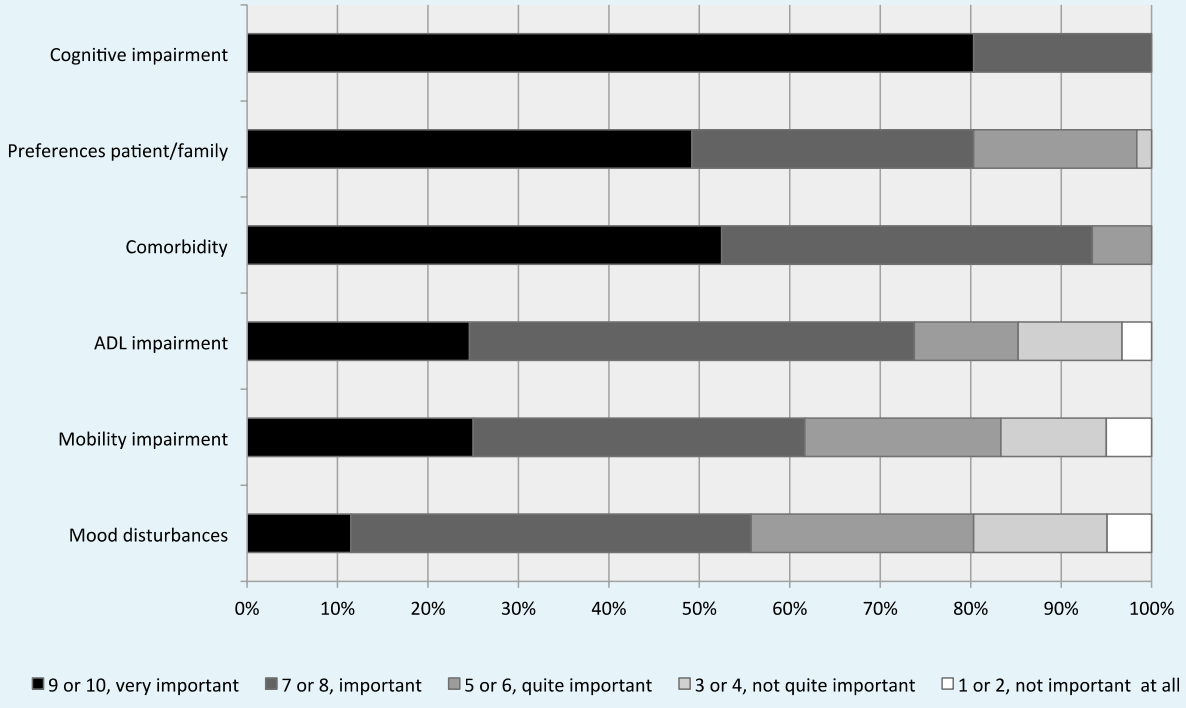
Additional evaluation of geriatric impairments

More than half of the respondents (56%) considered evaluation of geriatric impairments to be of potential benefit in the decision-making process before starting dialysis in elderly patients. Nephrologists in favour of a

Table 2. *Early withdrawal (< 6 months)*

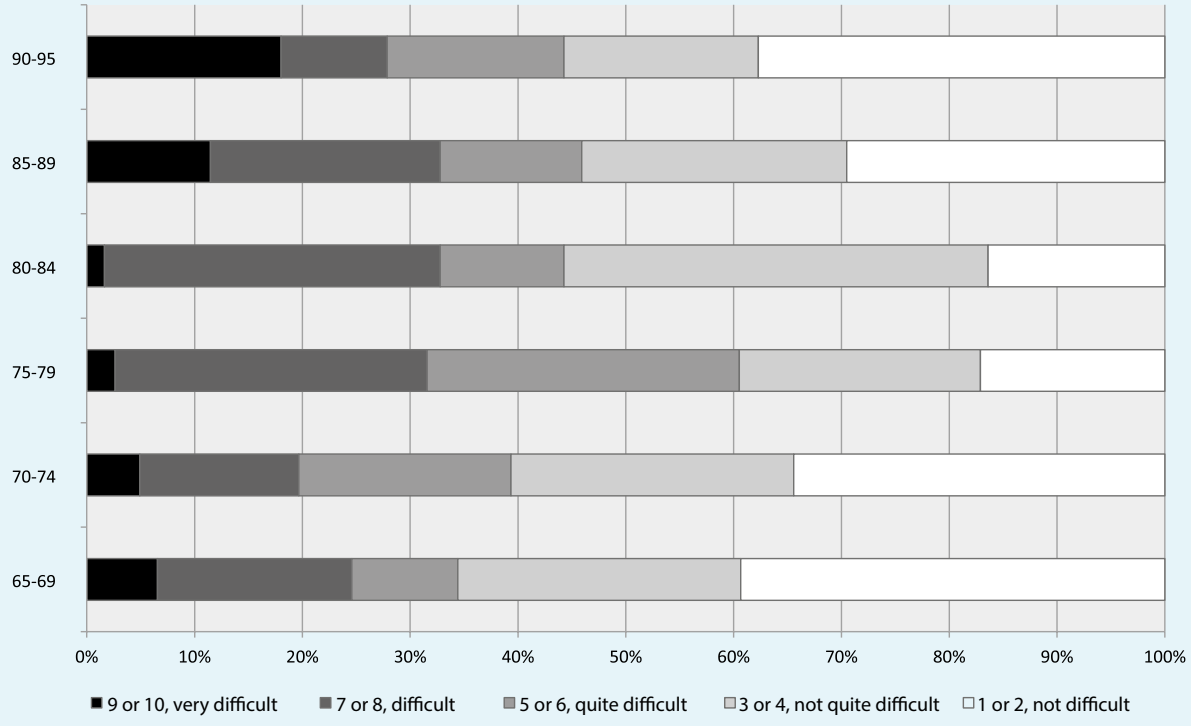
	Total (n = 72)
No. of nephrologists responded that withdrawal occurred at least once	**46 (64%)**
Surprised	*8 (19%)*
Not surprised	*33 (77%)*
Neutral	*2 (8%)*
Reasons for early withdrawal	**Total (n = 56)**
Lack of improvement in quality of life	17 (30%)
Decline general condition	13 (24%)
Progression of comorbidities	11 (19%)
Technical problems	7 (13%)
Evaluation after time-limited trial	5 (9%)
Difficulties in accepting the loss of self-reliance	1 (2%)
Decease of spouse	1 (2%)
Severe cardiovascular complications	1 (2%)

Figure 1. *Geriatric impairments taken into account in the decision-making process*



ADL = Activities of daily living.

Figure 2. *Difficulty of decision-making per category of age*



geriatric evaluation were generally younger (mean age 45.0 vs. 49.9 years, p = 0.02). This opinion was not influenced by gender. Arguments in favour of and against a geriatric evaluation are shown in *table 3*. Systematic evaluation of geriatric problems was expected to improve estimations about the condition after starting dialysis, which could help in informing the patient and his or her relatives (62%), in making one's own estimation of treatment success (47%) and in more often withholding dialysis in selected cases (11%). On the other hand, respondents found that different opinions between physicians could work counterproductively (33%) and it could be time consuming (19%). Of the nephrologists, 19% felt a geriatrician would lack sufficient knowledge regarding dialysis.

When asked about the ideal form of this evaluation, 78% of respondents preferred application of a short screening tool in the pre-dialysis clinic, supplemented with consultation of a geriatrician when needed while 23% preferred a comprehensive geriatric assessment, either performed by a geriatrician (18%) or a nephrologist (5%). Such an assessment was already performed as standard of care by 9% of respondents, while 26% of the respondents reported using one or more tools to assess one or more geriatric domains, most frequently focusing on cognitive impairments (e.g. the Mini Mental State Examination, MMSE) or frailty (*table 4*). Other geriatric impairments being tested were: impairments of ADL, depression, functional impairment, and mobility impairment.

DISCUSSION

This national survey revealed that geriatric impairments are considered important items influencing the decision-making process of dialysis initiation in the elderly, outweighing age as relevant item needing consideration. The majority of nephrologists (56%), especially younger colleagues, consider screening for impairments in the elderly population useful, but few use a geriatric assessment or screening instrument in the work-up of elderly pre-dialysis patients.

In general, decision-making in elderly ESRD patients was not considered difficult (median 4 (range 1-10)) but 89% of respondents at least occasionally reported difficulties in reaching consensus regarding treatment decisions. The 'Clinical Practice Guideline on Shared Decision-Making in the Appropriate Initiation of and Withdrawal from Dialysis' proposes to consider a time-limited trial when no consensus can be reached or the patient prognosis is uncertain.[19] However, the achieved quality of life after starting dialysis may not turn out as expected.[21] In a Canadian study of 584 ESRD patients (age 68 ± 14 years, mean time on dialysis 27 ± 22 months), 61% reported regretting their decision to start dialysis.[22] When looking at all cases of early withdrawal based on our survey, 77% were not unexpected to the responding nephrologist. This implies starting dialysis despite some hesitations about the benefits of dialysis is not exceptional. Worldwide,

Table 3. *Arguments in favour and against geriatric screening*

Arguments in favour of geriatric screening*	**n= 53**
Gaining more expertise to inform the patient and family about the expected condition after starting dialysis therapy	33 (62%)
Gaining more expertise to make the own judgment whether dialysis would be a good option	25 (47%)
Withholding dialysis in the right cases more often	6 (11%)
Make the decision-making process less time consuming overall	2 (4%)
More precise estimation of patients' condition	1 (2%)
Arguments against geriatric screening*	**n = 29**
Different opinions between physicians may cause confusion or 'overtreatment'	12 (33%)
Time-consuming, higher costs	7 (19%)
Doubts whether a geriatrician has enough knowledge of dialysis	7 (19%)
No evidence for a better prediction of outcome so far/ no positive experiences	3 (8%)
Decision should not be made based on cut-off value of a test	2 (6%)
Patients could feel they have to pass an exam before considered eligible	1 (3%)
False reassurance when the test results are good	1 (3%)
Could interfere with a good contact with the patients' general practitioner	1 (3%)
Not applicable for immigrants who do not speak Dutch	1 (3%)
Doubts whether it is a good predictor for quality of life	1 (3%)

*Respondents could give both arguments in favour or against

Table 4. *Geriatric assessment applied as standard of care*

	Total (n = 59)
No geriatric assessment applied	**40 (71%)**
Screening tool applied as part of standard care	**15 (26%)**
Cognition (e.g. mini-mental state examination)	12 (21%)
Frailty (e.g. Groningen Frailty Index)	8 (14%)
ADL impairment questionnaire (e.g. Katz)	6 (11%)
Depression (e.g. geriatric depression scale)	4 (7%)
Mobility impairment (e.g. Timed up and go, elderly mobility scale)	2 (4%)
Functional impairment (e.g. Lawton&Brody, Barthel Index)	1 (2%)
Comprehensive geriatric assessment applied	**5 (9%)**
Consultation geriatrician	1 (2%)
Screening for three or more geriatric impairments	4 (7%)
When considered necessary: geriatric consultation / screening tool applied	**4 (7%)**

ADL = activities of daily living.

based on the Dialysis Outcomes and Practice Patterns Study (DOPPS), most cases of withdrawal occur early after initiation of dialysis and account for 3-39% of deaths within the first 120 days, with a wide range between countries.[23] A time-limited trial may facilitate the decision-making process by postponing the definitive decision, but it will not prevent early withdrawal. These findings underline the need for a careful consideration of what to expect before the start of dialysis or a time-limited trial.

In our survey, cognitive dysfunction was considered most relevant of all geriatric impairments in treatment decision. Dementia is a known predictive factor for poor survival in patients initiating dialysis, with a two-year survival of 24% vs. 66% in patients without dementia ($p < 0.001$).[10] Cognitive impairment may compromise therapy adherence, diet and fluid restrictions, may lead to behavioural disturbances and higher care burden. Unexpected rapid decline of cognitive function was reported as a reason for early withdrawal, although this was not mentioned often (5%). Screening for cognitive function prior to dialysis initiation may help in obtaining an estimation of the patient's prognosis, the expected benefits of dialysis therapy and the risks of unwanted treatment outcomes.[8] A previous study found that cognitive impairment is largely underdiagnosed in dialysis and ESRD patients.[8] In our survey, only 21% of respondents reported using an objective instrument to assess cognitive function before dialysis initiation, although almost all considered it (highly) relevant to treatment decisions. A simple, validated test for cognition in the ESRD population is currently lacking. The Montreal Cognitive Assessment (MoCA), a brief cognition screening test, recently showed good sensitivity and specificity for cognitive impairments in prevalent dialysis patients and performed better than the better-known MMSE.[24] Whether this test will be of added value in decision-making for the elderly ESRD population is yet to be determined.

In addition to the disabilities previously mentioned to be relevant in the decision-making process,[17,18] such as comorbidity, vascular dementia and a poor physical

functioning, this survey shows mood disturbances and ADL impairment are also found to be relevant items needing consideration before starting dialysis therapy in the elderly. Depression is highly prevalent among dialysis patients, and undertreatment and underdiagnosis are common.[8] Both depression[25] and ADL impairment[26] are associated with adverse outcome in dialysis patients and early awareness might therefore be relevant in evaluating the patient prognosis, implementing early interventions and improving quality of life. As with cognition, it is not common practice to objectively assess these disabilities using a screening instrument. There were some initiatives (14%) to assess frailty, the phenotype of general decline in the ageing population.[27] Over the last decade, frailty has been recognised as a predictor for poor outcome in the dialysis population.[9] Although as yet no screening instrument has been validated for measuring frailty in the ESDR population, these initiatives may reflect the desire for a simple screening method for the overall condition in the elderly.

The present study has several limitations. The response rate of this nationwide survey was only 32%. This is a well-known issue in survey research. For example, previous international nephrology surveys yielded 50 or fewer responses in the Netherlands and other participating countries.[17,20] Responders and non-responders may differ in their interest in geriatric nephrology. This may have led to overestimation of the importance nephrologists seem to assign to geriatric impairments and the potential added value of screening for these impairments. A survey can provide only a simplified view of the complexity of daily practice. In an attempt to simulate real world decisions, this survey presented the questions concerning the importance of geriatric impairments in two different ways. For example, question 16, focusing on the value of the independent geriatric impairments, and question 19, incorporating geriatric impairments in a context of more complex decision-making, both showed geriatric impairments were considered more relevant than age itself in decision-making in elderly ESRD patients.

CONCLUSION AND POTENTIAL IMPLICATIONS

In this survey among Dutch nephrologists, geriatric impairments were shown to be considered relevant to the decision-making process regarding dialysis initiation in the elderly. Nephrologists are open for the use of screening instruments for geriatric problems, but structural, objective assessment of the presence and severity of geriatric impairments is not customary. This may be due to lack of validated screening tools in the ESRD and dialysis population. As geriatric impairments are associated with adverse outcome in dialysis, future research should focus on validating existing screening instruments in this patient population or developing new tools that take factors specifically relevant to renal disease and dialysis into consideration. In addition, it remains to be investigated whether the incorporation of some form of geriatric assessment in the decision-making process regarding initiation of dialysis will be useful in identifying vulnerable patients better suited for best supportive care.

DISCLOSURES

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Appendix

Questionnaire

1. What is your age?
2. Are you a man or a woman?
3. How many years of experience do you have working as a nephrologist?
4. Does your hospital have a dialysis clinic?
5. What kind of hospital are you working at? (University, large (> 600 beds), medium (400-600 beds), small (< 400 beds), dialysis clinic)
6. In which province are you working?
7. How many of the patients in your pre-dialysis clinic are more than 70 years old?
8. How many patients older than 70 years who are eligible for dialysis actually start dialysis?
9. How old was your eldest patient starting dialysis?
10. How many of your patients older than 70 year who were eligible for dialysis choose to withhold dialysis?
11. How often do patients older than 70 years choose to start dialysis despite of your advice not to start dialysis?
12. Can you recall withdrawing dialysis within six months after the start of dialysis therapy in an elderly patient?

Yes

13. What was the reason for withdrawing dialysis in that patient?
14. Were you surprised the dialysis had to be cancelled this soon after the start? Please explain.

No

15. How difficult do you find it to make the decision on starting dialysis in the elderly? Please score each age category on a scale 1 (very easy) – 10 (very hard)
(Categories: 65-69; 70-74; 75-79; 80-84; 85-90; 91-95)

16. How often do you take next items into account when making the decision on starting dialysis? Please score each item on a scale 1 (never) -10 (always)
(Categories: Cognitive impairment, mobility impairment, age, ADL impairment, comorbidities, preference patient/family, care giver burden, mood)

17. Is the decision to start dialysis discussed for every patient in a multidisciplinary team?

18. What specialisations are represented in the multidisciplinary team?

Appendix

19. Which patient is most eligible for dialysis in your opinion? Please rank all patients from 1 (most eligible) to 6 (less eligible)
    a. A 85-year-old patient, few comorbidities, no cognitive impairment, no ADL disabilities
    b. A 80-year-old patient, few comorbidities, no cognitive impairment, ADL disabled
    c. A 75-year-old patient, many comorbidities, no cognitive impairment, no ADL disabilities
    d. A 80-year-old patient, few comorbidities, mild cognitive impairment, no ADL disabilities
    e. A 70-year-old patient, many comorbidities, mild cognitive impairment, no ADL disabilities
    f. A 75-year-old patient, many comorbidities, mild cognitive impairment, ADL disabled

20. Please choose your best option in this fictive case:
    An elderly, frail 88-year-old patient lives in a care centre and needs help with all his activities of daily living because of a lower leg amputation and cognitive impairment. He is diagnosed with terminal kidney failure. The patient's family is convinced dialysis is the best treatment option for him. The patient himself confirms that he wants to opt for dialysis. You are his nephrologist and discuss with patient and family the possible unfavourable effects on quality of life for this patient taking his frail condition into account. Nevertheless, the family still prefers to start dialysis. What would you do?
    a. You have no doubts. If the patient and family are well informed and still prefer to start dialysis, then you do so.
    b. You have no doubts. You think dialysis is not in the best interest of this patient. You tell the patient and family that you will not start dialysis (even if the family considers going to another dialysis clinic instead)
    c. You have your doubts whether dialysis is in the best interest of this patient. You consult your colleagues is this case.
    d. You have your doubts whether dialysis is in the best interest of this patient. You decide to start with a dialysis test session of one month, and afterwards decide whether dialysis should be continued.
    e. Other, namely...

21. Are there any validated screening tools used in your pre-dialysis clinic to assess the clinical condition of elderly patients? If so, which ones do you use?

22. Do you think a routinely performed geriatric assessment would be helpful in making the decision whether dialysis is convenient in an elderly patient?

23. What should be part of such a geriatric assessment in your opinion?
    a. A comprehensive geriatric assessment applied by a geriatrician/geriatric nurse
    b. A geriatric screening tool applied by the nephrologist with the possibility to consult a geriatrician if needed
    c. A comprehensive geriatric assessment applied by the nephrologist
    d. Other, namely...

24. What would you consider the added value of a geriatric assessment in the pre-dialysis population?
    a. Time-saving
    b. More expertise to inform the patient and family about the expected condition after starting dialysis therapy
    c. More expertise to make the own judgment whether dialysis would be a good option
    d. Withholding dialysis in selected cases

25. Could you think of an adverse effect of a geriatric assessment? If so, what effect?

26. In your pre-dialysis clinic, is there any form of collaboration with the geriatric department in assessing elderly patients with terminal kidney failure?