Organ specialists coping with geriatric patients

Dialysis in old patients: Need for closer cooperation between nephrologists and geriatricians

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Abstract

End-stage renal disease (ESRD) is a common condition observed in the elderly. Ageing represents one of the main risk factors of the disease, in addition to hypertension and diabetes. ESRD can require the initiation of dialysis, which is a costly and complex strategy, particularly for patients aged 80 years or more. When the decision to initiate dialysis is being made by nephrologists, many parameters should be simultaneously considered to evaluate potential benefits for the patient, such as life expectancy, functional independence and, of course, quality of life. This decision-making process could be improved if comprehensive geriatric assessment were performed. Cognitive function and more particularly, a medical history suggesting dementia (which can be misdiagnosed in 50% of demented patients) must be carefully investigated. Indeed, ESRD and dementia share several risk factors such as ageing, but in addition, dementia may negatively impact on weekly dialysis programs and survival of treated patients.

1. Introduction

Chronic kidney disease (CKD) is characterised by a progressive decrease in glomerular filtration rate (GFR). CKD may lead to end-stage renal disease (ESRD) when creatinine clearance decreases to below 15 ml/min/1.73 m². The clinical and metabolic consequences of ESRD often require initiation of dialysis. There exist two main methods of dialysis, namely hemodialysis and peritoneal dialysis. Regardless of the strategy chosen, initiation of dialysis represents a major challenge for physicians, particularly in the management of old (over 75 years) or very old (over 80 years) patients. The decision to initiate dialysis should ideally be taken using a multidisciplinary approach, and should take into account the exact timepoint when dialysis will be started (sometimes dictated by the existence of a metabolic emergency), as well as the type of dialysis to be used. Other essential aspects that must be considered are the patient’s age, life expectancy with or without disability, preservation of the patient’s functional autonomy, and quality of life.

In this article, we will review the following points:

- Current data and epidemiological perspectives regarding old or very old patients requiring dialysis for ESRD.
- Existence of comorbidities among these patients, particularly cardiovascular disease, which can have an impact on their prognosis and survival.
- Impact of dementia syndromes and consequences of dialysis on cognitive function, factors that can often lead the patient to refuse initiation or request interruption of dialysis.

2. Chronic kidney disease: age is the main risk factor

CKD has come to be considered as a hallmark of the ageing process. By 2030, it is estimated that in the United States alone, 2 million people will require dialysis or kidney transplant [1]. Currently, approximately 1.8 million people around the world need dialysis, and many of these are candidates for organ transplant [2]. When GFR decreases to below 30 ml/min/1.73 m² of body surface area (stage 4 CKD), then referral to a nephrologist for evaluation is recommended, and renal replacement is clearly indicated when GFR is <15 ml/min/1.73 m² (stage 5) [3]. The principal factor that contributes to the progression of CKD is atherosclerosis. Certain risk factors for atherosclerosis can be controlled, such as hypertension, diabetes, smoking or dyslipidemia [4]. It is thus clear that the clinical characteristics and antecedents of patients with CKD are mainly cardiovascular. These cardiovascular comorbidities have a considerable impact on mortality in CKD patients, which is not necessarily improved by dialysis.

This statistical relationship between CKD, excess mortality and cardiovascular comorbidities is exacerbated by the prognostic role of CKD itself. Indeed, CKD is a major vascular risk factor, along with hypertension [5]. In association with these cardiovascular diseases, age contributes significantly to atherosclerosis, the main risk factor for CKD, leading to the need for dialysis at the terminal stage. If
dialysis is initiated, strict control of vascular risk factors is essential to prolong survival in dialysis-treated patients. These elements of overall management must be taken into consideration when the decision to initiate dialysis is being discussed.

3. Dialysis in very elderly patients: epidemiology and prognosis

An epidemiological study based on registry data covering more than 99% of persons starting dialysis in the United States [6] showed that there was an average annual increase of almost 10% in the number of patients aged over 80 years starting dialysis between 1996 and 2003. One-year mortality in this population after initiation of dialysis was 46%. According to this report, the main clinical characteristics associated with mortality were older age, non-ambulatory status and more comorbidities. In Europe, the proportion of subjects aged >75 years initiating dialysis was estimated at 8.2% in 1989, and increased to a reported 21.6% in 1998 in one study [7].

This significant increase in the number of very old subjects initiating dialysis has been the impetus for much research into the predictors of survival in this specific population.

In one cohort of 146 subjects with an average age of 83 years and suffering from CKD (as defined by creatinine clearance ≤10 ml/min), 107 subjects (73%) were proposed dialysis [8]. Initial clinical characteristics (before dialysis) and subsequent survival were compared versus patients who were not proposed dialysis (n = 37). Among patients who initiated dialysis therapy (n = 101, six refused), median survival was 28.9 months, significantly higher than median survival among non-dialysed patients (8.9 months). The independent predictors of death within 1 year of dialysis initiation were poor nutritional status, late referral to nephrologists and functional dependence.

In another study of nursing home residents starting dialysis in the United States [9], 61% of patients had either died or experienced a worsening of their functional status within 3 months after the start of dialysis, and at one year, this figure reached 87%.

These data suggest that the proportion of very elderly subjects (over 80 years old) starting dialysis is steadily increasing in western counties, and that the impact of dialysis on survival depends greatly on the patient’s initial state of health. Among the parameters that reflect state of health at dialysis initiation, functional and nutritional status are the two major geriatric syndromes that seem to have the greatest influence on survival.

Indeed, it is noteworthy that most of the reports that evaluated the impact of dialysis and survival among dialysed patients did not assess the impact of changes in cognitive status, despite the fact that cognitive decline is common in this age group.

4. End-stage renal disease and cognitive function

Alzheimer’s disease (AD) is the primary cause of dementia syndromes. In 2000, its prevalence in the United States was estimated at 4.5 million subjects [10]. In western countries, the prevalence of AD in subjects aged over 65 years is approximately 4.8% [11], and the number of patients with the disease increases twofold with every five years of age [12], reaching a prevalence of up to 20% in patients over 80 years of age. Age is the strongest risk factor for AD, in the same way as it is the main risk factor for progression of CKD.

Certain authors have suggested that in elderly subjects, AD and CKD share the same phenotype, since certain risk factors are common to both diseases, such as hypertension, diabetes or hypercholesterolemia [13]. Similarly, in vascular dementia, these same risk factors have an impact of equal, if not greater magnitude. In a population of subjects aged 65 years or older suffering from ESRD treated by hemodialysis, the risk of vascular dementia during the four-year follow-up period was multiplied by 7.4, and the one-year incidence of dementia (of any cause) was 4.2% in this population [14]. It would thus seem logical that the possibility of an association between ESRD and dementia should be considered systematically. From a geriatric point of view, assessment of cognitive function should be performed systematically before any decision to initiate dialysis is made. Several elements plead in favour of this joint management between nephrologists and geriatricians.

1) In almost 50% of cases, no diagnosis of dementia syndrome (and first among these, AD) has been given to the patient, or their family, nor was the treating physician aware of dementia [15].

2) Cognitive function in elderly subjects with ESRD is significantly altered, including among subjects undergoing dialysis, and these modifications will not necessarily be reversed by dialysis.

3) Overall survival of elderly subjects with AD is significantly reduced, by up to about 50% [16] or even further in dialysis patients [17].

4) Dementia syndromes constitute one of the main reasons for withdrawing or refusing dialysis, particularly in more severe clinical forms [18].

Two studies have shown a relation between the severity of CKD and the existence of cognitive decline discovered after a range of neuropsychological tests were performed [19,20]. Among the cognitive functions, executive functions were those that were most often affected [19]. The authors purport that in elderly subjects suffering from ESRD, the frequency of cognitive impairment was twice as high as that observed in a population of controls, and cognitive impairment was significantly greater in ESRD patients treated by dialysis.

Similarly, life expectancy is considerably shortened in the presence of dementia [16,21], not to mention the concept of disability-free life expectancy. Therefore, an overall estimate of life expectancy for patients suffering from both dementia and ESRD is particularly difficult to calculate when dialysis is being considered. The presence of dementia in patients with ESRD is a factor that often incites nephrologists to withhold or defer dialysis. Although there are no large-scale, prospective studies available that justify this approach, it would appear that the severity of dementia is not always taken into consideration in cases where dialysis is refused by the nephrologist. However, it could be postulated that if a diagnosis of dementia is made in a patient undergoing dialysis, this could be decisive when dialysis withdrawal is being discussed. Retrospective studies have shown that in cohorts of elderly patients undergoing dialysis, dementia (irrespective of its duration or severity) was most often observed in patients whose dialysis was discontinued [18,22]. Following up on the work of several Working Groups, the American Society of Nephrology published criteria that should prompt discontinuation of dialysis. These criteria focus mainly on comorbidities associated with CKD, and the existence of severe dementia is high on the list [23,24].

In conclusion, ESRD requiring dialysis in elderly patients should be associated with global geriatric assessment. Life expectancy, functional autonomy, quality of life and the impact of comorbidities should all be taken into consideration with a view to optimising the therapeutic decision-making process before initiation of dialysis. In this context, standardised, multidimensional and multidisciplinary gerontological evaluation could be useful. Closer cooperation between nephrology and geriatric teams would help bring to light any relevant information that could be useful, if not indispensable for the nephrologists when deciding on the appropriate therapeutic approach, particularly in frail, elderly subjects.
Conflicts of interest

None.

References


