Chronic Dialysis in Patients Over Age 65

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ABSTRACT

In the United States, persons over the age of 65 are expected soon to become the majority of those people who will require maintenance dialysis therapy. Many of these individuals have numerous comorbid medical complications, which, together with altered physiologic adaptation related to aging, create a great challenge for the nephrologist. Despite a considerably lower group survival rate and increased hospitalization utilization as compared with younger patients, many elderly dialysis patients tolerate therapy very well and appear quite satisfied with the quality of their lives. Both hemodialysis and peritoneal dialysis are suitable treatment modalities for elderly patients, but recommendations regarding type of dialysis must be individualized, taking both medical and psychosocial issues into consideration. Vascular access problems are particularly important for the elderly and contribute to significant morbidity. Malnutrition and cardiovascular complications also require special attention. Withdrawal from dialysis appears to be increasingly common among elderly ESRD patients and highlights the need for the completion of advance directives. A trial of dialysis may allow elderly patients and their families additional time to decide whether long-term dialysis is deemed appropriate.

Key Words: Hemodialysis, peritoneal dialysis, elderly, advance directives

It is indeed ironic that just 20 years after the United States End Stage Renal Disease (ESRD) program became federally subsidized, the group of persons over age 65 presently comprises the fastest-growing segment of the ESRD population. Just a few decades ago, persons over the age of 60 yr who were suffering from renal failure were often entirely excluded from dialysis programs. Limited financial resources and unavailability of dialysis machines were used as the reasons for preferentially offering this lifesaving therapy to younger individuals. Initial projections for the growth and costs of the U.S. ESRD program were therefore grossly underestimated. Increasing steadily since 1973, Medicare expenditures for ESRD alone reached approximately six billion dollars (1,2) in 1991, and it appears that a plateau is nowhere in sight. Health care costs for the entire United States have escalated during the past quarter century, and questions regarding the appropriateness of the utilization of expensive health care technology have risen to the forefront. The ESRD program has therefore come under intense scrutiny.

However, even before widespread interest in health care system reform, the renal community was attempting to develop a consensus regarding the selection of patients for renal replacement therapy. Although specific guidelines have not yet been developed, there has been little support for excluding individuals simply on the basis of age alone. Nevertheless, it is important to examine and understand the multifaceted nature of the elderly person who is receiving dialysis therapy. The purpose of this paper is to provide such an overview.

DEMOGRAPHICS OF ESRD AND THE ELDERLY

The main focus of this discussion is intended to provide clinically relevant material, however, it is important to appreciate some of the statistical data involving the older segment of the ESRD population. Currently, 20% of the U.S. population is older than 65 yr of age. This proportion is expected to increase significantly over the next few decades, with a similar increase anticipated for elderly individuals requiring dialysis. The following data from the 1995 United States Renal Data System (USRDS) report illustrate the changing patterns of dialysis in the elderly (3). Between 1987 and 1992, growth rates for treated ESRD incidence exceeded 10% annually for persons over the age of 65, and was 17.1% for those over 85. In 1984, 22,910 persons aged 65 or greater were undergoing dialysis or had functional renal transplants. By 1993, those greater than 64 yr of age numbered 69,937, comprising 31.8% of the Medicare ESRD population. This increase was distributed equally between sexes. In 1984, 11,496 men and 11,414 women aged 65 or older were receiving renal replacement therapy. By 1992, men and women in the ESRD program numbered 31,949 and 32,958, respectively (3). During this same time, the number of elderly U.S. blacks and whites living with ESRD increased nearly threefold. Although the total numbers are smaller, a more striking increase in treatment rates was seen.
TABLE 1. ESRD patients, aged 65 and older, alive on December 31 (3)

<table>
<thead>
<tr>
<th>Race</th>
<th>1984</th>
<th>1992</th>
<th>% Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Native American</td>
<td>136</td>
<td>741</td>
<td>445</td>
</tr>
<tr>
<td>Asian</td>
<td>209</td>
<td>1,481</td>
<td>539</td>
</tr>
<tr>
<td>Black</td>
<td>6,350</td>
<td>18,285</td>
<td>188</td>
</tr>
<tr>
<td>White</td>
<td>15,707</td>
<td>44,003</td>
<td>180</td>
</tr>
<tr>
<td>Other/Unknown</td>
<td>508</td>
<td>397</td>
<td>-22</td>
</tr>
</tbody>
</table>

among elderly Native Americans and those of Asian descent (Table 1). (3)

This striking rise in the number of elderly persons undergoing dialysis is not only the result of the increased availability of financial and technological resources, but also the change in willingness to offer such treatment to high-risk individuals. In the past, therapy was often empiric and was frequently based on a "best guess" outlook. As anticipated, elderly patients frequently did not fare well with complicated medical regimens. However, several reports indicate that many elderly patients adjust well to ESRD therapy and enjoy reasonably good quality of life (4-7).

The fear of potential litigation for refusal to recommend or accept people for dialysis therapy may also result in an increased number of elderly individuals being selected for dialysis. This concern may be more prevalent in the United States than elsewhere in the world, however. A recent Canadian report prospectively examined the practice of not offering dialysis to patients with a poor prognosis (8). Twenty-five percent of patients referred for consideration for dialysis were not accepted for therapy because of poor functional capacity and multiple comorbid medical conditions. No legal difficulties or requests for second opinions were encountered. Recent studies clearly indicate an increased desire for individuals to discontinue dialysis therapy if, in their own minds, they are not doing well (9-10). However, the Canadian authors urge nephrologists to exercise responsibility and advise patients not to undergo dialysis if it is not felt to be in the patient's best interest.

MORTALITY AND SURVIVAL

Over the past 10 yr, 1-yr unadjusted survival rates have remained fairly constant for elderly individuals undergoing dialysis in the United States, ranging from 70% for those 65 to 69 yr of age to approximately 45% for individuals greater than 84 yr of age (3). Two- and 5-yr survival rates decrease to approximately 54% and 22%, respectively, for persons starting dialysis at age 65 to 69 yr. However, the 5-yr survival rates for those aged 85 and older, the most rapidly growing group of persons starting dialysis, is less than 4%. Table 2 compares the survival rates of elderly ESRD patients and ESRD patients in the U.S. population (11). In addition, 1-yr survival probabilities for elderly ESRD patients, computed from first day of treatment, are slightly lower than those calculated from Treatment Day 91, censored at first transplant. However, 2- and 5-yr survival rates are essentially identical in both ESRD groups for all 5-yr cohorts aged 65 to 85+ yr (3).

Byrne et al. showed similar results for 95,394 dialysis patients aged 55 or greater, but further analyzed age cohorts by comparing survival rates in patients with specific causes of ESRD (12). Selected diagnoses included diabetes, hypertension, glomerulonephritis, and polycystic kidney disease, because these conditions account for 75% of all new cases of ESRD. As expected, survival rates were worse for each cohort of advancing age regardless of ESRD diagnosis. For persons aged 65 to 69 with polycystic kidney disease, glomerulonephritis, and hypertension as the cause of ESRD, 5-yr survival was 38.4%, 26.2%, and 21.8%, respectively—considerably better than that for those with diabetes (12.5%) (12). One-, 3-, and 5-yr survival rates for all ESRD age groups were substantially lower than those for the comparable U.S. population, similar to the data in Table 2.

The authors emphasized, however, that even these apparently dismal success rates provide a measure of the success of dialysis therapy because these patients would have survived only a short time without renal replacement therapy.

Despite these reports describing "reasonable success" in dialyzing elderly patients, the benefits of chronic dialysis in these patients must be tempered because of the cumulative frailties, intercurrent medical complications, and additional stress that occur with advancing age. Multivariate analysis may be helpful in identifying individuals who cannot be expected to survive beyond even a brief period of dialysis (13). If such an analysis could be refined and simplified, it might be extremely valuable for physicians in helping their elderly patients make decisions about dialysis therapy.

TABLE 2. Survival rates for ESRD patients compared with U.S. population (3)

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Years of Survival</th>
<th>ESRD U.S.</th>
<th>ESRD U.S.</th>
<th>ESRD U.S.</th>
<th>ESRD U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>1</td>
<td>71.01</td>
<td>98.19</td>
<td>54.31</td>
<td>96.42</td>
</tr>
<tr>
<td>70</td>
<td>2</td>
<td>65.32</td>
<td>97.30</td>
<td>47.32</td>
<td>94.68</td>
</tr>
<tr>
<td>75</td>
<td>3</td>
<td>60.17</td>
<td>95.98</td>
<td>35.26</td>
<td>92.12</td>
</tr>
<tr>
<td>80</td>
<td>5</td>
<td>54.86</td>
<td>93.96</td>
<td>27.43</td>
<td>88.30</td>
</tr>
</tbody>
</table>

* Survival rates for ESRD patients, starting at the first day of treatment, were computed from data for the most recent years available: 1- and 2-yr survival from the 1991 to 1992 cohort years; 5-yr survival from the 1987 to 1988 year (3). Survival probabilities for the U.S. population were computed from data from the 1993 report of the National Center for Health Statistics (11), with special assistance from Dr. Friedrich Port and Dr. Robert Wolfe, University of Michigan Kidney Epidemiology and Cost Center.
CAUSES OF DEATH

The causes of death among ESRD patients, regardless of age, are largely related to cardiovascular disease, which accounts for 47% of all deaths reported in 1991 to 1992 (3). However, cause-specific death rates tend to be higher for dialysis patients because the total ESRD population includes the transplant cohort, which is generally younger and healthier. Specifically, dialysis patients aged 65 or older have death rates for cardiac arrest, other cardiac disease, acute myocardial infarction, and cerebrovascular disease of 59.8, 59.5, 35.6 and 20.2/1000 patient yr at risk. These are double the corresponding rates for individuals younger than 65 yr of age. Infection (including septis cemia) and malignancy account for 45.2 and 13.7 deaths/1000 patient yr, respectively, among older dialysis patients—also twice the rate of their younger counterparts. For all other causes of death, rates are similar between younger and older dialysis patients (3).

Withdrawal from dialysis is becoming an increasingly recognized cause of death among dialysis patients. Since 1990, the Health Care Financing Administration ESRD death notification form has requested data on whether patients discontinued dialysis before death. During 1991 and 1992, 17% of patients withdrew from dialysis before death from any cause (3). The 1994 USRDS report indicated that withdrawal accounted for 19.5 deaths/1000 patient yr for all ESRD patients (2). However, for individuals aged 65 or older, the rate of 50/1000 patient yr ranked as the second leading cause of death. In the 1995 USRDS report, the rate for death as a result of withdrawal from dialysis among elderly white dialysis patients was 81.5/1000 patient yr, and 34.2/1000 patient yr for elderly blacks (3). These rates of withdrawal were nearly three times greater than in the 45 to 64 yr age group for both races, and nearly sixfold greater than for those aged 20 to 44. The reasons provided for withdrawal from dialysis usually relate to either chronic failure to thrive (42%) or to acute medical complications (35%) (3). In addition, elderly diabetics and nondiabetics discontinue dialysis at similar rates (64 and 69/1000 patient yr, respectively). However, among younger cohorts, nondiabetics withdraw from dialysis only one-fifth to half as often as diabetics. An analysis of Michigan ESRD patients also revealed that white patients withdrew from dialysis at a greater frequency than did black patients in all age groups (14). These differences became much more striking among patients greater than 70 yr of age. Moss has provided an excellent discussion regarding the issues of dialysis withdrawal (15).

DIAGNOSTIC CONSIDERATIONS

The diagnosis of renal failure is frequently overlooked in older individuals, many of whom may have required little medical care during their earlier years. Early symptoms such as weakness, fatigue, and anorexia are often attributed to other conditions or to "age." Low dietary protein intake and diminished muscle mass are both common in older individuals and may result in low or normal values for BUN and serum creatinine, even in the face of advanced renal failure (16,17). Some older patients may not be readily referred for evaluation and treatment of renal failure because of family and physician reluctance. Cultural and socioeconomic barriers may explain some of the variation in incidence rates for dialysis treatment among the elderly. This may be especially true in areas with insufficient dialysis resources or insurance coverage. Even though many of the elderly are already insured by Medicare, which covers 80% of dialysis expenses, the ability to pay may still be a factor that limits dialysis access for many. It appears that nephrologists are becoming increasingly aware of the demonstrated benefits of dialysis for many elderly patients. However, non-nephrologic physician opinion on the utility of dialyzing the elderly is unclear.

Moulton et al. examined the geographic patterns of treatment of ESRD among the elderly (18). Low-incidence areas in the United States appear to be largely clustered in the southeastern states. This is especially striking for nonwhites in the south, and for Native Americans in Oklahoma and Alaska. Besides the explanations provided above, the high incidence of hypertension and diabetes-related mortality in these regions may also contribute to low ESRD rates because these conditions frequently result in deaths before the development of advanced renal failure.

ESRD TREATMENT OPTIONS FOR THE ELDERLY

Once elderly individuals gain access to the ESRD system, they are presented with the same treatment options as their younger counterparts. The most recent USRDS report contains complete data regarding treatment modalities for all Medicare ESRD patients (3). As of December 31, 1992, the majority of ESRD elderly were receiving in-center hemodialysis (83%). Only 10 to 12% were undergoing peritoneal dialysis, and less than 5% had functioning renal transplants. Very few (less than 1%) of the elderly were performing home hemodialysis. These patterns contrast with those aged 45 to 64, who are more likely to be transplanted (27.4%). However, in-center hemodialysis is still the most common treatment modality among all patients (59%). It is uncertain whether subsequent reports will show much deviation from these patterns of treatment.

Choice of dialysis modality is largely influenced by nephrologist and other caregiver recommendations. There are no data to indicate that the elderly are more or less likely to follow their physician's recommendations than younger patients. All things considered equal, both hemodialysis and peritoneal dialysis may be considered excellent forms of therapy for older persons.

In-center hemodialysis may be preferred for those who are confused and unable to perform self-care or...
peritoneal dialysis satisfactorily. Hemodialysis is also usually recommended for patients in whom the presence of intraperitoneal adhesions from previous surgery, chronic diverticulosis, ostomies, hernias, or obesity may make performance of peritoneal dialysis risky or unsatisfactory. Hemodialysis may be the only remaining option for those who fail attempts at peritoneal dialysis because of recurrent peritonitis, inadequate clearance, or noncompliance. Interestingly, many elderly persons initially treated with peritoneal dialysis because of "high risk" vascular disease may have a surprisingly smooth and uncomplicated course with in-center hemodialysis. Some elderly patients choose hemodialysis because they or their families do not want to assume the responsibility for performing peritoneal dialysis at home or because the dialysis center offers a source of socialization not otherwise available to them. It would appear, however, that most patients, including the elderly, simply choose in-center hemodialysis because it is most convenient or because they feel safer having trained staff perform their treatments.

Typically, persons with active cardiovascular disease, such as coronary artery disease, arrhythmias, peripheral vascular disease, or bleeding diatheses, are advised to select peritoneal dialysis because of its relative safety. Those who fail to do satisfactorily with hemodialysis (often because of inadequate vascular access) must switch to peritoneal dialysis. Although some may fare well, others survive for only a short time and succumb to worsening malnutrition or infection. Frequently, they discontinue dialysis altogether. Travel to and from the dialysis center may pose great difficulty for many older persons. Peritoneal dialysis is likely to be especially appealing for those who live a considerable distance away, such as in rural areas.

For those patients requiring chronic nursing home placement, the choice of dialysis modality may be less flexible (19). Most extended and skilled care facilities are not able to provide dialysis care and must arrange for patients to be transported to a nearby dialysis center, usually for hemodialysis. Others are able to provide on-site peritoneal dialysis (20). Some nursing home residents may undergo "home hemodialysis" through cooperative arrangements between nursing home and dialysis facility staff.

Comorbid conditions are common in elderly dialysis patients. Although the presence of some complications would be expected to result in such patients being treated with peritoneal dialysis, data from the USRDS case-mix study indicate otherwise (21). In fact, hemodialysis patients had a greater number of comorbid conditions than did those receiving peritoneal dialysis. Only the aggregate measure of peripheral vascular disease was more likely to be present in peritoneal dialysis patients.

Peritoneal dialysis in the elderly provides an excellent alternative to hemodialysis. This topic has been reviewed elsewhere (22), but will be briefly discussed in this report. Several techniques have been successfully used, including continuous ambulatory peritoneal dialysis (CAPD) and intermittent peritoneal dialysis (IPD), utilizing automated dialysis cycler systems. Peritoneal dialysis is particularly appealing for older individuals because it allows them to be dialyzed easily at home. The elderly often have special needs, and the flexibility of peritoneal dialysis makes this an important consideration. Some individuals live alone, but a nearby caregiver such as neighbor or relative may be able to assist with dialysis, particularly using a nighttime cycler. For individuals living in small apartments, mobile homes, or other types of limited housing, the inability to store peritoneal dialysis supplies may pose a problem, however. Peritoneal dialysis also provides a needed source of calories, which are frequently of great importance in older patients.

Surprisingly, the use of peritoneal dialysis among elderly patients appears to be less common than would be expected, with only 10 to 12% utilizing this mode of treatment (3). Withdrawal from peritoneal dialysis among the elderly occurs for a number of reasons. Caregiver burnout is probably more common than is appreciated. An elderly spouse or other relative may be quite able to assist with the dialysis procedure, but many elderly dialysis patients have or develop additional complications, which result in an exhaustive full-time job for the caregiver. As is the case for younger individuals, recurrent or persistent exit-site or peritoneal infection frequently results in catheter failure or inadequate dialysis. Such episodes often give rise to anorexia and severe protein losses, which cause further malnutrition. Despite these complications, conversion to hemodialysis may be fairly smooth and allows for elderly patients to continue dialysis.

SELECTED CLINICAL PROBLEMS IN ELDERLY DIALYSIS PATIENTS

Ismail et al. have reviewed numerous dialysis-related problems faced by the elderly (22). The following discussion highlights and expands on some of the more important areas of concern.

Cardiovascular Disease

The presence of cardiovascular disease is very high among elderly individuals with ESRD. Older patients have, by their nature, been subjected to numerous cardiovascular risk factors for a number of years; hypertension is extremely prevalent. In addition, old age is an independent risk factor for the development of myocardial disease. Ischemic and dilated cardiomyopathy, left ventricular hypertrophy, and calcific valvular heart disease are all common among elderly patients. Additive factors also include anemia, hyperparathyroidism, and aluminum accumulation, as well as uremia itself.

The elderly experience great morbidity from peripheral vascular disease. As described above, vascular access complications because of ischemic distal ex-
tremities result in frequent hospitalization, infection (including gangrene), and amputation. These problems are particularly prevalent among diabetics, who account for approximately 31% of those persons aged 65 and older undergoing renal replacement therapy (3). Interestingly, diabetes is the most common primary disease among all ESRD patients (36.7%), but ranks second behind hypertension in the elderly.

Because of intrinsic myocardial disease, elderly dialysis patients are especially prone to develop intradialytic hypotension and arrhythmias. Rapid fluid removal from the intravascular space may exceed the plasma refilling rate. Coupled with an inability to increase peripheral vascular resistance, abrupt hypotension may be seen. Autonomic dysfunction (particularly in the elderly diabetic patient), inadequate cardiac reserve, intradialytic hypoxemia, and various medications also contribute to the development of symptomatic hypotension. In addition, postprandial hypotension may be seen occasionally, and is related to patients' inability to increase cardiac output because of an obligatory increase in splanchnic blood flow in the postprandial state. This poses a dilemma for many patients, including the elderly, for whom dialysis schedules may interfere with mealtimes, and who must therefore eat while undergoing dialysis.

**Vascular Access**

Vascular access considerations are of paramount importance for older persons requiring renal replacement therapy (19,22,23). For most, transplantation is not an option, so satisfactory dialysis access will be required indefinitely. A Brescia-Cimino fistula is the most preferable type of vascular access for young and elderly patients alike. The presence of arteriosclerotic vessels and inadequate forearm veins may preclude satisfactory development of an arteriovenous fistula, however, and this type of access may require an extended time to develop properly. Therefore, for most elderly patients, alternative types of vascular access are usually necessary. Arteriovenous grafts, using a variety of synthetic vascular materials have become the mainstay of vascular access surgery for most elderly individuals. Bovine grafts are rarely used today. Location of the vascular graft will vary depending on the status of the patient's peripheral vascular anatomy. Generally, a brachiocephalic graft is used initially. Failure of this site may require alternative locations, such as the upper arm, upper thigh, or others (24). Proper selection of an access site is critical to avoid repeated vascular surgery and serious complications such as peripheral arterial vascular steal syndromes. Older patients are particularly prone to development of ischemic complications because of preexisting atherosclerosis.

In recent years, the development of improved vascular catheters has enabled older persons to continue to receive dialysis when arteriovenous fistulae and grafts have failed. A variety of intravenous catheters that can be used as temporary or extended vascular access are currently available. Many patients are able to receive excellent dialysis for extended periods with such catheters, particularly those placed in the internal jugular vein. Prolonged use of the subclavian vein has come under criticism because of the high rate of subclavian stenosis (25). This may change with availability of improved catheter design.

Several considerations must be kept in mind when choosing vascular access for the elderly. Patients who are referred early in the course of their renal disease can be properly examined and counseled regarding the various alternatives. In these circumstances, an arteriovenous fistula may be able to be created. In persons with extensive vascular disease, several access procedures may be required before suitable blood flow can be obtained. Individuals not certain as to their long-term wishes concerning dialysis need not undergo extensive vascular surgery, but can be suitably and comfortably dialyzed with an internal jugular catheter. This type of access is also particularly appealing for those in whom survival is expected to be fairly short, but who still wish to undergo dialysis, or those in whom acute renal failure requires an extended period of dialysis. Lastly, the presence of cardiac and peripheral vascular disease may pose obstacles to maintenance of vascular access.

A comparison of vascular access prevalence among individuals over the age of 65 is presented in Table 3. Fourteen percent of patients were dialyzed with an arteriovenous fistula, 52% with some type of arteriovenous graft, and 34% using internal jugular or subclavian catheters (primarily the former). Table 4 contrasts vascular access types between patients younger and those greater than the age of 65. The number of patients in this community hospital facility differs in the two tables because the data was obtained from two time periods—September 1994, and April 1995. However, the proportion of patients with different types of vascular access is similar for both time periods. Mean age for each type of access is similar. For patients younger than the age of 65, 25% had an arteriovenous fistula, in contrast to only 11.6% of those older than 65. Conversely, the elderly appeared more likely to require use of an arteriovenous graft or temporary catheter. The small sample size invalidates meaning-
Vascular access complications in the elderly are similar to those seen in younger individuals. Arteriovenous fistulae are probably the safest and least likely to become infected or result in arterial steal syndromes. Inadequate blood flow, however, frequently results in fistula failure because of stenosis or thrombosis. Infection rates in individuals with arteriovenous grafts are extremely high (26,27). These may be superficial, but often become deep seated, resulting in sepsis and the urgent need for immediate graft removal. Arterial steal syndromes should be anticipated in frail individuals with longstanding atherosclerosis. The "white glove syndrome," common in many dialysis units, is seen in patients who wear a glove to keep an ischemic hand warm. Venous hypertension may also pose serious complications in patients who have had prior subclavian vein catheterization (25,28). Although this complication has been seen within only a few weeks of subclavian catheterization, subclavian stenosis may remain unnoticed for many years. Creation of an upper-extremity arteriovenous fistula or graft results in high venous flow, which overwhelms the stenotic subclavian vein. Massive edema and extensive development of tortuous veins may occur throughout the entire extremity. Venous hypertension may also result in ulcerations of the fingers, which rapidly heal after correction of the venous stenosis. High-output congestive heart failure is an infrequent but important complication, even among elderly individuals (29,30). This is somewhat surprising, considering the limited cardiac reserve among many of these persons.

Hospitalization

Hospitalization poses special problems for older individuals with ESRD. In 1990, dialysis patients aged 65 or older spent an average of 16.7 days in the hospital each year (31). By 1992, mean hospital days per patient had dropped slightly to 14.5 for older patients, whereas patients aged 20 to 64 were hospitalized for only 12.2 days, and those aged 20 to 44 for 11.2 days, on average (3). Although 10% of both groups had 30 or more hospital days, 75% had fewer than three admissions. Mean length of stay for patients older than 65 yr of age was 9.5 days, in contrast to 8.6 days for the younger cohort, aged 20 to 64. The 20- to 44-yr age group, however, had a mean length of stay of only 8.1 days. Clearly, younger patients have fewer days of overall hospitalization than do those older than 65 yr of age.

The 1991 USRDS data highlight the fact that heart disease is responsible for the largest number of dialysis-patient hospitalizations (32). As expected, admissions for coronary artery disease are especially common for the 65- to 74-yr age group. Infections and gastrointestinal disease are also common, but rates for these conditions are not different between younger and older patients. Unpublished data suggest that vascular access admissions are more frequent and longer for older individuals. More studies regarding hospitalization issues in the elderly are sorely needed.

Besides the usual difficulties faced by older patients while they are in the hospital, elderly dialysis patients have even greater drains on their time and limited resources. Additional visits for preoperative laboratory and anesthesia evaluations are often required on nondialysis days, which may be especially problematic for those who have difficulty with transportation for their outpatient dialysis sessions alone. Day of surgery admissions often require that the dialysis patient return home after an evening dialysis treatment, only to have to report to the hospital early the next morning for a planned surgical procedure. In addition, utilization programs often require discharging patients according to "standardized guidelines," which often do not consider important nonmedical conditions. For example, some elderly dialysis patients live alone, and are not able to be properly transported to and from outpatient dialysis treatments during the immediate post-hospital period. Unlike other patients, who can be discharged to the comfort of their homes for further convalescence, dialysis patients must continue to travel outside their homes to receive necessary dialysis for treatments.

Short-term nursing home placement may be an option for some individuals if they meet skilled criteria, but for many this is not the case. Coordination of care between dialysis and hospital staff, family caregivers, and home health agencies is essential.

Disruptions in nutrition frequently occur for hospitalized patients, and the elderly are especially vulnerable to missing meals because of scheduling of tests. Weight may change significantly because of loss of lean body mass, which may result in fluid overload when the patient returns to the outpatient dialysis setting. The value of short-term intradialytic parenteral nutrition (IDPN) is unclear in this setting, but nephrologists must pay close attention to the need for nutritional supplements for hospitalized elderly dialysis patients.
Nutrition

Serious nutritional problems contribute to much of the debility and morbidity experienced by older dialysis patients. Inadequate dialysis with associated anorexia is commonly seen in patients with chronic vascular access problems. Some elderly persons live alone and are unable to prepare proper meals for themselves. Others, especially those with fixed or limited incomes, lack sufficient financial resources to purchase food, which may be complicated by large out-of-pocket medication and transportation expenses. In addition, poor eating habits often antedate the development of renal failure and the added challenges of eating a “prescribed diet.” Ethnic and other cultural factors are especially important to consider. Missing or carious teeth and poor-fitting dentures may result in difficulty chewing and swallowing. Neurologic impairment from prior cerebral ischemic episodes may also make swallowing difficult, with aspiration and pneumonia frequently developing. Gastrointestinal motility disorders such as achalasia, reflux esophagitis, or peptic ulcer disease must be suspected in elderly patients who are prone to recurrent aspiration. Chronic obstruction and overt fecal impaction are also frequently overlooked causes of anorexia and nausea in these individuals. Hypomotility may also result from autonomic dysfunction, especially in diabetics, but medications such as calcium or aluminum-containing phosphate binders, antirhythmic agents, and neuroleptics may also be responsible. Lastly, intercurrent illness may cause anorexia and decreased calorie and protein intake, especially in patients who must prepare meals for themselves or an ill spouse. Renal dietitians and other dialysis staff must remain aware of these and other circumstances that may result in suboptimal nutrient intake in elderly patients. Intervention may simply involve providing assistance to the patient and family members in enlisting support from church or other community agencies for meals. The use of inexpensive nutritional supplements may be helpful, and it may be necessary to provide these during dialysis. IDPN is beneficial in improving protein and calorie malnutrition in dialysis patients (33-35). Reports dealing with the efficacy of IDPN have not compared results between younger and older patients. However, many of the patients described in the literature have been older than 65 yr of age. No particular risks with the use of IDPN have been demonstrated to be more prevalent among elderly persons. Although risks have been minimized by the use of carefully designed protocols, inconsistent reimbursement for this expensive form of therapy limits its widespread use at present.

Psychosocial issues

Elderly dialysis patients encounter several psychosocial problems that compound their complicated medical problems. Frequent contacts with caring dialysis staff and other patients may provide a welcome source of socialization for many older persons who have limited access to outside activities. On the other hand, spending 10 to 12 h each week away from their families may contribute to the high frequency of depression seen in elderly dialysis patients. Confusion may occur from subclinical strokes, transient episodes of hypotension, or medications. Forgetfulness and inability to comprehend instructions or continue to tolerate the demands of maintenance dialysis simply because doing so enables them to live longer and feel better. For many, there comes a time when neither goal can be met. It is not possible to predict with certainty when that time will occur, and decisions regarding medical care are therefore frequently left in the hands of family members or friends. Most people recognize the inevitability of death, but some, including dialysis patients, are not able to openly discuss their feelings about this. Discussion regarding the use of advance directives has increased considerably among health care professionals and the public. Inadvertently, dialysis units were not included in the Patient Self Determination Act of
1990 (36), whose purpose was to educate and encourage patients to complete advance directives. This is valuable for all patients, but is especially important for the elderly to consider because they represent those patients most likely to voluntarily withdraw or be withdrawn from dialysis because they are unable to make these decisions themselves (15,37). The National Kidney Foundation has recently developed guidelines for renal professionals ("Implementing Advance Directives: Suggested Guidelines for Dialysis Facilities") and a companion brochure for patients and families ("Advance Directives: A Guide for Patients and Families"), which have been disseminated throughout every U.S. dialysis unit (38). These documents will be extremely beneficial for the renal community.

Adequacy of Dialysis

Major effort has been directed toward understanding dialysis efficacy. The positive relationship between dialysis dose and patient survival is well accepted. Data from the 1994 USRDS report (2) suggest that 38% of U.S. dialysis patients may be underdialyzed, and it is possible that the elderly may comprise a large proportion of this group. Dialysis prescriptions for many patients have inappropriately been set low because of a low predialysis BUN level. As described earlier, many elderly patients in particular have inadequate dietary protein intake, which results in spuriously low values for BUN. Other factors especially likely to result in a suboptimal dialysis dose being delivered to elderly patients include vascular access problems with inadequate blood-flow rates, disruption of dialysis sessions because of hypotensive episodes, vomiting, or early discontinuation of dialysis (39).

Anecdotal experience suggests that dialysis practice for the elderly may be different from that for younger patients. Nephrologists may be more reluctant to revise or replace marginal vascular access or to increase dialysis time or frequency for their older patients. In some instances, inadequate prescriptions are inadvertently established for the convenience of family members. Important components of the dialysis prescription may be overlooked and will result in a suboptimal dialysis dose being delivered (Table 5). Practice guidelines for hemodialysis have been developed and, hopefully, will result in improvements in dialysis care, especially for vulnerable patients such as the elderly (40).

Rehabilitation and Quality of Life

The goals for elderly patients undergoing dialysis may be different from those for younger age groups. Long-term survival (greater than 10 yr) is often not anticipated—not is it expected. However, some individuals and their families may have unrealistic expectations of just what dialysis can accomplish. For example, although dialysis will ameliorate uremic symptoms and improve congestive heart failure, it will not prevent the progressive vasculopathy or neuropathy associated with diabetes. In addition, the changes in lifestyle required by dialysis, coupled with the trade-offs of potential debilitation, may not be appealing for some patients. Nevertheless, several studies have provided strong evidence for acceptable survival and quality of life among elderly dialysis patients (4,41). Many individuals feel that dialysis offers them the chance to spend increased time with family and friends, and some rank their health at least as good as others their age.

Quality of life issues are often related to the perception of how well rehabilitated patients become. Concerns about poor rehabilitation among elderly patients undergoing dialysis may misrepresent the extent to which these individuals remain functional (42,43). However, physical disabilities are common and lead to increased frailty and, subsequently, greater dependence on others for activities of daily living. Kutner et al. examined several psychosocial variables among elderly dialysis patients and concluded that functional status, either objective or subjective, was an excellent predictor of survival (44).

Exercise programs designed for dialysis patients properly have focused on improving and maintaining cardiovascular and musculoskeletal fitness (45–47). Even minimal attention to improving physical function results in significant benefit. It may be easy to recognize elderly dialysis patients with severe functional impairment, but the challenge is to identify and modify the factors that contribute to increasing debility before it becomes advanced (44). Development of rehabilitation protocols and programs for dialysis patients must therefore include attention to the special needs of the elderly. The definition of rehabilitation, then, must take into consideration those quality of life issues that are deemed important by the individuals themselves. It is imperative that clinicians develop a better understanding of why dialysis patients develop poor quality of life (48).

SUMMARY

Nephrologists today, and especially in the future, must become well versed in the care of elderly pa-
patients. This group of individuals, because of their numerous medical problems, require greater time and effort than do more stable younger patients. It is anticipated that the elderly will continue to comprise the majority of U.S. patients undergoing renal replacement therapy. Improved survival rates for the dialysis patients as a whole will likely be seen for this group as well, even considering the greater likelihood of the elderly to withdraw from dialysis.

Both hemodialysis and peritoneal dialysis should be considered suitable options for dialysis in the elderly, but special consideration must be given to patients' clinical problems as well as their preferences and expectations. To a large degree, these preferences will be based on the balance that the elderly perceive to exist between length and quality of life. Selection of the appropriate therapy for any individual with ESRD involves a multifactorial decision involving patients' preferences, a physician's interpretation of patients' needs, family situation, geography, and other issues (19).

The use of advance directives will therefore play a critical role in management of the elderly dialysis patient. When making decisions about advance directives, discussions regarding values and preferences should be conducted before dialysis therapy is initiated, if possible. Whenever doubt exists about whether to offer dialysis to an older individual or not, a trial of dialysis should be considered.

REFERENCES


