

## SPECIFICITY OF DIALYSIS IN THE ELDERLY – DILEMMAS

DRAGAN KLARIĆ, PETRA GRBIĆ PAVLOVIĆ and VERA KLARIĆ<sup>1</sup>

*Zadar General Hospital, Department of Dialysis and  
<sup>1</sup>Department of Psychiatry, Zadar, Croatia*

The global increase in the proportion of older population contributes to the increasing number of patients with renal insufficiency. This disorder particularly involves the old (age 70-75) and very old (over 80) population groups. The number of comorbidities is increasing and life expectancy reduced with aging. Cross-sectional analysis of ten-year survival showed a rate of 33.9% in patients treated at the Hemodialysis Center, 23.81% in transplanted patients and 19.35% in dialyzed patients. In patients having started hemodialysis (HD) at the age of  $\geq 70$ , the mean survival was  $20.27 \pm 18.62$  months, in those that died  $15.54 \pm 17.35$  months, and in survivors  $30.29 \pm 17.85$  months. Among HD treated patients, 35% survived for up to one year, 18% for two years and 8% for  $\geq 3$  years. Karnofsky index was below 50% in all patients that survived, while the Malnutrition Inflammation Score and Subjective Global Assessment indicated malnutrition. In Croatia, the number of HD patients is constantly increasing as the result of population aging, better, accessible and equal health care that prolongs life span, easier access to substitution methods, more accesses to the vascular system, development of the national transplant network and good immunosuppressive therapy. All this provides biological, economic and normative space for replacement therapy. Old age, comorbidities and poor nutritional status influence high mortality, poor functional status and impaired quality of life. Survival results correspond to reports in the literature.

**Key words:** elderly patients, dialysis, survival

Address for correspondence: Dragan Klarić, MD  
Department of Dialysis  
Zadar General Hospital  
Bože Peričića 5  
HR-23000 Zadar, Croatia  
E-mail: dragan.klaric@zd.t-com.hr

### INTRODUCTION

There is rapid increase in the number of elderly patients in the world who need dialysis treatment. These reports are consistent from different countries of America, Canada, Europe and Australia. The problems that accompany old age are multiple<sup>(1)</sup>. There are different attitudes to stratify age limits. There are various age group classifications, so that some propose young old age 60-69, middle old age 70-79 and very old age  $\geq 80$  years, whereas others set the following limits: young old age 65-74, middle old age 75-84 and oldest old age  $> 85$  years. However, life span has extended and the increase in the elderly population with all related comorbidities is inevitable. End-stage renal disease has a much higher incidence in elderly than in young population and is constantly growing worldwide, either as a disease, comorbidity, or as a result of various states. This raises questions of physiology and pathophysiology of aging and changes in the glomerular filtration rate (GFR). Is there a clear stance on normal laboratory values adjusted for age lim-

its? To what degree is GFR a physiological variant for a particular age? Does hemodialysis (HD) extend lifetime of very old people? The answers are not always precise. According to Singh et. al.<sup>(2)</sup>, prognosis is often based on subjective assessment and should include the ability to detect patients with end-stage renal disease who will be treated with HD, professional teams for communication with such patients, as well as guidance with solid attitudes<sup>(3)</sup>. Elderly population is often exposed to doctor, family or guardian decisions that are against their wishes, either due to the lack of communication or lack of knowledge about the methods and procedures to be employed. Procedures can leave mental and physical consequences (suffering) in spite of being performed professionally, and these patients say, "if I knew what I had to go through, I would have never agreed to it". Therefore, it is necessary to respect patient decisions, especially when we are aware that they may be close to the end of life and would rather choose palliative care than these procedures. The aforementioned author gives examples of giving up patients having

started dialysis in 25% of cases before their death in the US population. The same source says that in one Canadian study, 60% of patients complained of having started dialysis treatment, and half of them claimed they did so upon doctor persuasion<sup>(2)</sup>. No matter what, we must not forget individual approach and have to respect the will of the patient when he wants to be subjected to any procedures, including kidney transplantation.

## PATIENTS

We performed retrograde analysis of 10-year survival in patients treated in dialysis unit. On cross-sectional

analysis of all patients at the time of testing, we determined the types of access for dialysis according to age categories. Then we selected a group of patients aged  $\geq 70$  at the time of their starting dialysis treatment. We recorded outcomes at 1, 2, 3, 4 and  $\geq 5$  years. In patients that survived 6 months after the end of monitoring the Malnutrition Inflammation Score (MIS) and Karnofsky index were determined<sup>(4)</sup>. Data were processed using standard statistical analysis. We examined a total of 77 patients from beginning of treatment, 70 66.23% of men and 33.77% of women, 28.57% of them aged 70-75, 45.45% aged 76-80 and 25.97% aged  $\geq 80$ . (Table 1)

Table 1  
*Patient distribution according to age and sex*

	Age (yrs), n (%)			Total N (%)
	70-75	76-80	$\geq 80$	
Male	14 (63.64)	22 (62.86)	15 (75.0)	51 (66.23)
Female	8 (36.36)	13 (37.14)	5 (25.0)	26 (33.77)
Total	22 (28.57)	35 (45.45)	20 (25.98)	77 (100)

## RESULTS

Retrograde analysis of ten-year survival of dialysis patients showed that 19.35% of all study patients (age range, 25-87 years) were treated with dialysis for more than 6 months. There was a general trend of elderly patients prevailing on dialysis. The cross-sectional analysis of the test year at the Center showed that there were 31.76% of patients aged  $\leq 60$  years and 49.23% of patient older than 71; 57.65% of them had AV fistula, 11.76% temporary catheter and 30.59% permanent catheter. When we selected patients older than 70, there were 77 patients recorded in 5 years. Analysis of five-year survival in elderly patients showed the following

mean survival rates: 20.27 $\pm$ 18.62 months all, 15.54 $\pm$ 17.35 months in those that died, and 30.29 $\pm$ 17.85 months in survivors (dialysis).

Table 2 shows outcomes according to age groups. It is interesting to note how death rates changed with age, i.e. younger age was associated with lower mortality rate, whereas the highest death rate was recorded in the 76-80 age group. There were 25 survivors, 14 (56%) male and 11 (44%) female patients, that started HD at age 70. After 6 months, MIS score 7 or more was observed in 10 (40%) patients. The mean MIS was 5.68 $\pm$ 2.56, range 1-12. The mean Karnofsky score in patients that survived  $\geq 6$  months was 50 $\pm$ 12.91, range 30-80.

Table 2  
*Patient distribution according to outcome and age*

Outcome	Age (yrs), n (%)			Total N (%)
	70-75	76-80	$\geq 80$	
Died	6 (11.75)	29 (56.86)	16 (31.37)	51 (66.23)
Living (dialysis)	15 (62.5)	6 (25.0)	3 (12.5)	24 (31.17)
Recovered			1	1 (1.3)
Transplanted				0
Other unit or modality change	1			1 (1.3)
Total	22 (28.57)	35 (45.45)	20 (25.98)	77 (100)

Table 3  
*Patient distribution according to survival and age group*

Survival (year)	Age (yrs), n (%)			Total N (%)
	70-75	76-80	≥80	
<1	3 (8.57)	17 (48.57)	15 (42.86)	35 (45.45)
<2	8 (44.45)	6 (33.34)	4 (22.21)	18 (23.38)
<3	4 (50.0)	3 (37.5)	1 (12.5)	8 (10.39)
<4	2 (25.0)	6 (75.0)	0	8 (10.39)
≥5	5 (62.5)	3 (37.5)	0	8 (10.39)
Total	22 (28.57)	35 (45.45)	20 (25.98)	77 (100)

## DISCUSSION

Analysis of our data revealed the presence of very old population with a large number of associated comorbidities and a high degree of malnutrition according to MIS and Karnofsky score. In the Center, there were more than 49.23% of elderly patients (older than 70), with a high rate of temporary or permanent central venous catheter (CVC) as access for dialysis (42.35%). Most of the patients that survived 1, 2, and 3 years were in the 76-80 age group, whereas none from the >80 age group survived for 4 or 5 years. Elderly survivors have low ability of independent functioning (the mean Karnofsky score in those surviving ≥6 months was 50%) and poor nutritional status (MIS 5.68). All this favors development of infection, new comorbidities, worsening of the already impaired quality of life, and uncertain prognosis. The question is whether all patients need dialysis treatment, in which context definitive decision should be considered relative to the expected prognosis and especially respecting patient wish. Can we agree that in old age, low clearance without heart failure, hyperhydration, hyperkalemia, acidosis and uremic toxicity with preserved diuresis should be observed because the planned approach may not be used or such intervention could aggravate the patient condition? According to Glasscock<sup>(2)</sup>, decreased GFR in the elderly can be explained by anatomical changes in terms nephrosclerosis and decay of individual glomeruli. These morphological changes associated with significant albuminuria or proteinuria are serious warning, regardless of age. Furthermore, GFR declines with age, depending individually on the presence of diabetes, hyperlipidemia, smoking, atherosclerosis, etc., along with primary renal disease which, if present, additionally worsens the condition. Reduction in clearance below 45-59 should not be considered as chronic kidney disease (CKD) without the presence of other signs of the disease<sup>(2)</sup>. High age negatively affects outcome of patients on HD. In a study in patients aged >75, malnutrition had negative effect on overall survival, regardless of the dose of dialysis<sup>(5)</sup>. Dialysis accesses are often the source of frustration and failure, especially with

AV fistula. It is a pathomorphological substrate for poor outcome. It can be associated with traditional age related factors such as hypertension, dyslipidemia, diabetes, etc. In uremic inflammation, oxidative stress, uremic toxins, damage to the endothelium, calcification of arterial media, vein damage, and eventually intimal hyperplasia cause AV fistula dysfunction.

While on the other side of the CVC, although the only way out, in most cases in very old population it often implies additional risks (infection, thrombosis), this approach is preferred by patients and sometimes by the staff to facilitate manipulation. CVC is much more frequently used in elderly as compared with younger patients on dialysis in Europe, Australia, North America, but rarely in Japan (less than 1%)<sup>(1)</sup>. Of course, it should be viewed differently in particular groups of the elderly, and AV fistula may be considered the first option; however, if it is not possible, then aretoriovenous graft (AVG) should be applied. Considering survival for the first 18 months, AVG may prove better than AV fistula<sup>(2)</sup>. Transplantation should not be marginalized in elderly patients because it can prove either beneficial or a risk. Therefore, the choice of treatment modality in these patients should be based on strict and thorough assessment. There is no specific age that would be considered a limit, since the overall condition is essential for transplantation rather than age. In the early posttransplant period, there is a high risk of death in this group of patients, but later it progressively diminishes and life expectancy with transplanted organ is longer<sup>6</sup>. We must not forget the frequent posttransplant diseases these patients are prone to, i.e. diabetes, osteoporosis, infections, and malignancies. Transplantation is unquestionably beneficial for some patients. There are still problems encountered in practice, related to very old patients with multiple complications and poor prognosis, such as refusing or discontinuing dialysis after starting dialysis treatment, as reported in the literature. These may refer to socioeconomic issues or legally defined procedures and patient rights, or their guardians do not accept this mode of treatment<sup>7</sup>.

## ETHICAL DILEMMAS

Many nephrologists often meet with the treatment of old people because of the extended life expectancy. Somatic treatment is often very complex, requiring expertise and empathy. In order to make appropriate decisions and provide optimal treatment for the elderly with associated diseases, nephrologists should preferably be familiar with some basic psychological concepts of functioning of every human that are deeply subconscious and serve the patient to pass more easily through traumatic reality. These are also known as defense mechanisms.

When the patient is cooperative, everything is much easier; however, when he is negativistic for any reason, then psychiatric help is needed to eliminate the cause of negativism and if possible proceed with psychiatric treatment in such patients.

When both somatic and psychological or psychiatric resources have been exhausted, ethical dilemmas frequently appear and are very complex. In case of profoundly demented and dying patients, a physician will do everything to support patient survival, at least for some time. Occasionally, it will require patient family consent, and sometimes patient family will refuse it.

In the complex treatment of elderly patients with many associated, complex diseases, it may sometimes be difficult to make the diagnosis, determine prognosis and imminent death. It is even more difficult to make any decisions that affect ethical domain, in addition to those we have been trained, i.e. help the patient until the last moment. In my opinion, it is necessary to work on the issue of our own decisions in a similar situation, and in accordance with current, healthy mental capacity make a decision and thus help their families and doctors, just as in case of organ donation.

Many times, we are faced with the duty of providing bad news to elderly patients, such as news about their disease and its prognosis, which can be rather stressful for both. It is even more difficult to make decisions that are of different ethical perspective than the one that all physicians know, i.e. help every patient until the very last moment. I believe that patients which are psychologically competent should make their own decisions in situations like these, i.e. decide whether they want to keep fighting or give up their battle.

The substitution treatment of elderly CKD patients should have a reasonable individual approach. There are no clear guidelines, as they are mostly vague and neutral. For some patients, replacement procedures can be beneficial, and for the others harmful. Physicians should be trained to provide information about treatment options, taking care of life expectancy, favorable and detrimental effects of the procedures, and the patient wishes.

The patient should be allowed to choose the modality of treatment, the type of access and enrolment in the transplant list.

Aging is an integral part of the life cycle that is extended, resulting in accumulation of many factors that directly or indirectly influence GFR decline. Significant GFR reduction in combination with other factors for replacement therapy should be considered individually. The patient must be detected early, properly educated, and should be aware of all treatment modalities. Decisions must be signed by the patient or guardian. The will and dignity of the person should be respected.

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## SAŽETAK

### POSEBNOST DIJALIZE U STARIH I VRLO STARIH BOLESNIKA – DILEME

D. KLARIĆ<sup>1</sup>, P. GRBIĆ PAVLOVIĆ i V. KLARIĆ

*Opća bolnica Zadar, Odjel za dijalizu i  
<sup>1</sup>Odjel za psihijatriju, Zadar, Hrvatska*

U svijetu je ubrzan porast broja starijih bolesnika koji trebaju liječenje dijalizom. Ti se izvještaji poklapaju iz raznih zemalja. Problemi koje nosi starija dob su višestruki. Različiti su stavovi za stratifikaciju dobnih granica. Bilo kako bilo, dobne granice su produžene i porast starije populacije sa svim pratećim komorbiditetima je neizbježan. Kronična bubrežna bolest ima puno veću incidenciju u među starom negoli među mlađom populacijom i u stalnom je porastu u svijetu bilo kao bolest, komorbiditet ili posljedica raznih stanja. Ova činjenica nameće pitanja fiziologije i patofiziologije starenja i promjena u glomerularnoj filtraciji (GF). Ima li jasnih stavova o normalnim laboratorijskim vrijednostima prilagođenim dobnj granici? U kojem stupnju je GF fiziološka varijanta za konkretnu dob? Produžava li liječenje hemodijalizom životni vijek vrlo starih osoba? Odgovori nisu uvijek precizni. Stara populacija često je izložena odlukama liječnika, obitelji ili skrbnika mimo svoje želje, bilo zbog nedostatka komunikacije ili zbog nepoznavanja postupaka. Procedure mogu na bolesnika ostaviti psihičke i fizičke posljedice (patnje), bez obzira na to što su sve napravljene profesionalno, oni često kažu "da sam znao što me čeka, ne bih pristao". Zbog toga je nužno poštivati odluku bolesnika. Analizom vlastitih podataka vidljiva je prisutnost veoma stare populacije s velikim brojem pridruženih komorbiditeta te visokim stupnjem pothranjenosti (MIS) i Karnofskyjeva skora. U Centru je više od 49,23% populacije starije od 70 godina, s velikom zastupljenošću privremenog ili trajnog centralnog venskog katetera kao pristupa za dijalizu (42,35%). Najviše preživjelih do 1, 2 i 3 godine bilo je u skupini od 76-80 godina, a u skupini starijih od 80 godina nitko nije preživio 4 ili 5 godina. Kod preživjelih bolesnika visoke dobi sposobnost za samostalno funkcioniranje je veoma mala. Karnofskyjev zbir za preživjele 6 mjeseci i više bio je u prosjeku 50%.

*Ključne riječi:* stari bolesnici, dijaliza, preživljenje