

Renal Replacement Therapy in Patients over 65 Years Old

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Abstract

Age at onset of renal replacement therapy (RRT) is increasing in all countries. Two substitution methods of renal function remain available: hemodialysis (HD) and peritoneal dialysis (PD). It was a retrospective study carried out on January 2015 and it included patients older than 65 years, monitored for HD and PD. We studied their epidemiological and clinical profile, their evolution, and the elements of prognosis. Two groups of 42 patients were included. The first was about 30 HD patients representing 25% of all patients on HD with an average age of 71 ± 4.5 years. The second was concerning 12 patients on PD having a mean age of 69.8 ± 3.5 years and representing 11.7% of all patients on PD. Functional and vital prognosis of a patient with end stage renal disease (ESRD) depends, in the elderly, on psychological, cognitive functions, and the degree of autonomy.

Keywords

Renal Replacement Therapy, Elderly, Hemodialysis, Peritoneal Dialysis

1. Introduction

The aging of the current population and future is recognized by all demographic studies. The health professional currently holds the age of 75 to define an old person.

The incidence of end stage renal disease and age at onset of renal replacement therapy (RRT) is increasing in all countries. The number of older patients requiring dialysis therapy is rising, reflecting the ageing of the general population [1]. Kidney transplantation is not generally given to this category of the population, two substitution methods of renal function remain available: HD and PD.

We report our experience of care in RRT of the elderly population.

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2. Material and Methods

It was a single-center retrospective study carried out in our department of nephrology, in January 2015 and included patients older than 65 years in RRT: HD and PD.

Exclusion criteria: Patients on hemodialysis for less than 3 months and patients with acute infection, or active neoplasia.

We studied their epidemiological and clinical profile, the different complications during RRT and the elements of the prognosis.

Clinical, biological and radiological parameters were identified from medical records. Patient's records were point data of patients at the time of the study in January 2015.

The ethics committee had no objections against this study since it reflects our clinical work habits and did not include supplementary measures (other biological or radiological examinations).

We performed a comparative study of these parameters between patients on HD and those in PD.

Baseline characteristics were described as means and standard deviations for continuous variables, and frequencies and proportions for categorical variables.

A study of the correlation was made between the various parameters by the statistical test CHI2. *P* value \leq 0.05 was regarded as significant.

3. Results

Two groups of patients were included.

For the first group, there were 30 chronic HD patients, 13 women and 17 men representing 25% of all patients on HD. The average age was 71 ± 4.5 years. The initial nephropathy was vascular nephropathy in 7 cases, diabetic nephropathy in 11 cases, indeterminate nephropathy in 5 cases, chronic interstitial nephritis in 5 cases and nephropathy secondary to polycystic kidney disease in 2 cases. The age of initiation of hemodialysis was 69 ± 3.5 years.

Vascular access was an arteriovenous fistula (AVF) in 16 cases, an AV graft (AVG) in 2 cases and a tunneled catheter in 2 cases. Seven patients were anuric, 14 patients were oliguric and 9 patients had residual diuresis.

The number of sessions per week was 3 times in 8 cases, 2 times in 11 cases and only one session per week in 11 cases.

Several patients had comorbidities with myocardial infarction in 4 cases, heart rhythm disorder in 3 cases, sleep apnea syndrome in 2 cases, and dementia in 2 cases.

Fifteen patients were not autonomous. The impossibility of walking was observed in 3 cases, a limitation of walking in 7 cases, bilateral blindness in one case, and decreased auditory acuity in 4 cases.

The average hemoglobin (Hb) was 8.28 ± 1.9 g/dl, the mean serum cholesterol was 3.98 ± 1.01 mmol/l, the mean triglyceride level was 1.29 ± 0.9 mmol/l, the mean serum calcium was 2.1 ± 0.4 mmol/l, the mean serum phosphorus was 1.46 mmol/l ± 0.5 , the mean parathyroid hormone (PTH) was 848.07 ± 490 pg/ml, the mean serum albumin was 31 ± 4.2 g/l.

Hemodynamic tolerance of hemodialysis was good in 14 cases only. Two deaths occurred following a cardiovascular complication.

The second group was concerning 12 patients on PD: 7 men and 5 women, having a mean age of 69.8 ± 3.5 years and representing 11.7% of all patients on PD. Seven were on automatic peritoneal dialysis and 5 on continuous ambulatory peritoneal dialysis. Kidney diseases were diabetes nephropathy in 58.3% of cases and vascular nephropathy in 41.6% of cases. Patients were not autonomous, they were helped by their children in 62.5% of cases and their partners in 38.5% of cases. Comorbidity was important: hypertension 91.6% of cases; Diabetes 66.6% of cases and heart disease 33.3% of cases.

Peritonitis was present in 5 cases, recurrent in 1 case. Staphylococcus was the causative organism in 3 cases.

The average biological values were: Hb: 9.6 ± 0.9 g/dl, Albumin: 27 ± 2.6 g/l, cholesterol: 4.1 ± 1 mmol/l, triglyceride: 1.09 ± 1.2 mmol/l, Serum Calcium: 2.21 ± 0.28 mmol/l, phosphorus: 1.79 ± 0.15 mmol/l and PTH: 524 ± 378 pg/ml.

One death occurred after a bronchopulmonary infection.

The differences on Socio-demographic characteristics, comorbidities and biological data between the 2 groups are presented in **Table 1**.

They were not statistically significant except for albumin level.

Table 1. Clinical and biological parameters.

	HD (N = 30)	PD (N = 12)	P
Age (Years)	71 ± 4.5	69.8 ± 3.5	0.1
Sex (M/F)	17/13	7/5	0.15
Diabetes (%)	11 (36.66%)	8 (66.66%)	0.09
HTA (%)	7 (23.33%)	11 (91.66%)	0.8
Heart Disease (%)	7 (23.33%)	4 (33.33%)	0.5
Dementia (%)	2 (0.06%)	0	0.9
No autonomy (%)	15 (0.5%)	8 (66.66%)	0.1
Death (%)	2 (6.66%)	1 (8.33%)	0.9
Hemoglobin (g/dl)	8.28 ± 1.9	9.6 ± 0.9	0.75
Albumin (g/l)	31 ± 4.2	27 ± 2.6	0.05
Calcium (mmol/l)	2.1 ± 0.4	2.21 ± 0.28	0.8
Phosphorus (mmol/l)	1.46 ± 0.5	1.79 ± 0.15	0.5
PTH (pg/ml)	848.07 ± 490	524 ± 378	0.07
Cholesterol (mmol/l)	3.98 ± 1.01	4.1 ± 1	0.1
Triglyceride (mmol/l)	1.29 ± 0.9	1.09 ± 1.2	0.5

4. Discussion

Reduced mortality and morbidity, prolongation of the patient's life, and better clinical outcomes of RRT allowed having older patients regularly monitored in dialysis units.

The age of patients with end-stage renal disease is increasing in all countries. The dialysis population is old with a median age mostly in the 60s and even over 70 years in some European regions [2]. In France, patients older than 75 years represent 40% of the patients who start RTT [3]. In Belgium, patients above 75 years comprise 41% of dialysis patients, as compared to 20% in the United Kingdom and 17% in Japan [4].

Older dialysis patients have a tendency to present later for dialysis, have a higher number of comorbid conditions, are at higher risk of cognitive dysfunction, impaired physical function, falls, poor nutrition and have increased levels of frailty [5] [6].

Old patients with terminal chronic renal failure can be offered conservative medical treatment or active renal replacement therapy. Advanced dementia and severe neurological sequels of stroke were shown as the conditions underlying the nephrologists' decision making not to provide dialysis in elderly patients [7].

The demographic, psychological, and health-related factors create a net of interdependences. Elderly patients with complex medical problems are a challenge to the health care team, clearly requiring the cooperation of physician, nurse, dialysis technician, social worker, dietician, physical medicine specialist, and a host of other subspecialists [8].

Many older patients do not have the opportunity for transplantation, so quality of life (QOL) in RRT is particularly important. The choice of dialysis modality has a major impact on many aspects of an individual's life [9].

A prospective study of incident and prevalent patients starting on dialysis over the age of 70 years, is the only study to have focused on older patients showed that outcomes, survival and QOL were not different for patients on HD and PD [10] [11].

The perception that older patients are more likely to have barriers to PD related to physical problems, social circumstances and cognitive dysfunction can result in the healthcare team believing that PD at home is not feasible in this patient group [12].

No difference in the course of functional status was observed between patients treated with PD or HD [13].

PD confers a substantial advantage in reducing rates of hospitalization for sepsis as compared with HD with

central venous catheters among many older patients [14].

Risks and benefits of vascular access strategies in patients with differing life expectancies are controversial. AVF do not result in a lower lifetime risk of bacteremia compared with AVG in older patients without a permanent access at onset of ESRD, and that only those with longer life expectancy will benefit from pre-emptive AVF placement [14].

In our study, the differences on socio-demographic characteristics, comorbidities and biological data between the 2 groups of patients (HD and PD) were not statistically significant except for albumin level. This is probably due to the fact that there is a loss of albumin greater on DP compared to HD which adds to the poor nutrition on the elderly. However retrospective nature of our analysis and the small number of patients precludes any meaningful conclusion.

Recent studies suggested that dialysis provided a survival advantage compared to conservative management for most of stages 4 - 5 of chronic kidney disease patients over the age of 75. However, this advantage was lost for patients with multiple co-morbidities and ischemic heart disease [15] [16].

Regardless of the treatment choice, a multidisciplinary and multidimensional approach in the care of these patients is strongly needed [17].

5. Conclusions

Nephrologists are increasingly confronted with an elderly population of patients who have a large number of comorbid conditions requiring ongoing care.

Older patients on dialysis have unique needs and characteristics, and their outcomes vary from that of their younger counterparts.

RRT decision in the elderly requires consideration of functional and cognitive impairment and cardiovascular disease.

Both life expectancy and life quality should be taken into account.

Our results cannot be generalized because of the small size of our series.

Conflict of Interest

There are no conflicts of interest.

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Abbreviations

Arteriovenous fistula: AVF
Arteriovenous graft: AVG
End stage renal disease: ESRD
Hemodialysis: HD
Hemoglobin: (Hb)
Peritoneal dialysis: PD
Parathyroid hormone: PTH
Quality of life: QOL
Renal replacement therapy: RRT