

DAILY HOME HEMODIALYSIS IS AN AVAILABLE OPTION OF RENAL REPLACEMENT THERAPY IN SPAIN

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OBJECTIVES

When hemodialysis (HD) was introduced in Spain in the 70s and 80s as a renal replacement therapy, we had a lack of place in dialysis centers and hospitals to offer the treatment to our patients. For this reason, a vast program of home hemodialysis (HHD) was developed.

When HD was gradually developed in the 90s, dialysis units were created and patients were transferred from their homes to units. However, HHD decreased in Spain until almost disappear. Nowadays HHD is reappearing in Spain. Although far distance is not a problem in our country, HHD benefits as survival and low costs are well considered.

The objective of the present study is to analyze characteristics and survival in our patients receiving HHD.

METHODS

This is a descriptive study.

We analyzed all patients receiving HHD (1969-2015).

We collected baseline characteristics, HHD vintage, survival rate, number of hospital admissions and reasons for leaving the technique.

From 1969 to 2000, patients were dialyzed three times per week, from 9 hours to 12 hours per week.

From 2000 to present dialysis schedule changed to six sessions per week, and at least 2 hours per session.

We have analyzed in more detail the second group, and we have collected also characteristics of dialysis: dialyzer, monitor, blood flow, conductivities, keeper profile, timing for the training at the Hospital and time during home conditioning to water treatment implementation.

We have analyzed laboratory parameters (haemoglobin, transferrin saturation index, calcium, phosphorous, PTH, albumin, prealbumin, C Reactive protein) and drugs: number of antihypertensive drugs and erythropoiesis stimulant agents (ESA) doses.

Dialysis doses were evaluated measuring equivalent renal urea clearance using Casino and Lopez equation, and Beta-2 microglobuline reduction rate using the equation: $(\text{Beta-2 microglobuline predialysis} - \text{Beta-2 microglobuline postdialysis}) / \text{Beta-2 microglobuline predialysis} \times 100$.

We collected patients using ESA and intravenous iron. We calculated erythropoietin resistance index (ERI) by using week erythropoietin doses (UI) adjusted for patients weight divided into haemoglobin (IU/kg/week/g/dL). When darbepoetin α was prescribed, we used a dose conversion ratio of 1:200.

Table 1: Baseline characteristics and follow up of the study population:

	TOTAL (N:51)	GROUP 1 (N:39)	GROUP 2 (N:12)
Age (years)	45 \pm 23 (20-67)*	45 \pm 23 (19-62)*	45 \pm 23 (29-67)*
Gender (male, %)	77	79	82
Dialysis vintage (months) **	43 (22-76)	43 (22-76)	43 (18-64) **
Vascular access (VAF, %)	96	100	80
Vascular access flow (ml/min)	350 \pm 20	301 \pm 15	402 \pm 25

* Age range.

**Median and interquartile range.

VAF: vascular access fistula.

Table 2: Baseline characteristics of patients receiving daily home hemodialysis since 2000:

	MEAN AND SD
Age (years)	45 \pm 23 (29-67)*
Gender (male, %)	82
Diabetes (%)	0
HTA (%)	50
Number of antihypertensive drugs	0,7 \pm 0,3
Dialysis vintage (months)	43 (18-64) **
Vascular access (VAF, %)	80
Vascular access flow (ml/min)	402 \pm 25
Part/ Pven (mmHg)	-170/180
Equivalent renal urea clearance(ml/min)	15,6 \pm 4,2
Beta-2 microglobuline (mg/L)	15,2 \pm 4,0
Beta-2 microglobuline reduction rate (%)	67 \pm 18
Conductivity (mS/cm)	13,7 (13,6-13,8)
Bicarbonate conductivity (mS/cm)	-3 (-4, 0) **
Albumin (g/dL)	4,1 \pm 1,8
Prealbumin (mg/dL)	23 \pm 11
CRP (mg/dL) **	0,01 (0,01-0,02) **
Hb (g/dL)	11,9 \pm 4,8
TSI (%)	27 \pm 12
Weekly ESA dosis (IU)***	2500 (250-12000) **
ERI (UI/sem/kg/g/dl)	3,7 \pm 2,1
Ca (mg/dl)	8,7 \pm 2,3
P (mg/dl)	4,1 \pm 0,9
PTH (ng/L)	290 \pm 123

* Age range.

**Median and interquartile range. N: 12 patients.

*** Two patients did not need ESA, and they are not included in ERI.

HTA: hypertension arterial.

VAF: vascular access fistula. Part: arterial pressure of vascular access; Pven: venous pressure of vascular access.

mS/cm: milliSiemens/centimeter.

CRP: C-reactive protein. Hb: hemoglobin. TSI: transferrin saturation index. ESA: Erythropoiesis stimulating agents (ESA). ERI: Erythropoiesis resistance index.

RESULTS

TIMING: Monitor used are 4008S (FMC \oplus). Dialyzers are HF80S y FX 80 (FMC \oplus). Mean timing to learn the technique at the hospital is 27 \pm 4 dialysis sessions. Mean timing in home conditioning to install pipes and water treatment to the dialysis room was 35 \pm 6 days.

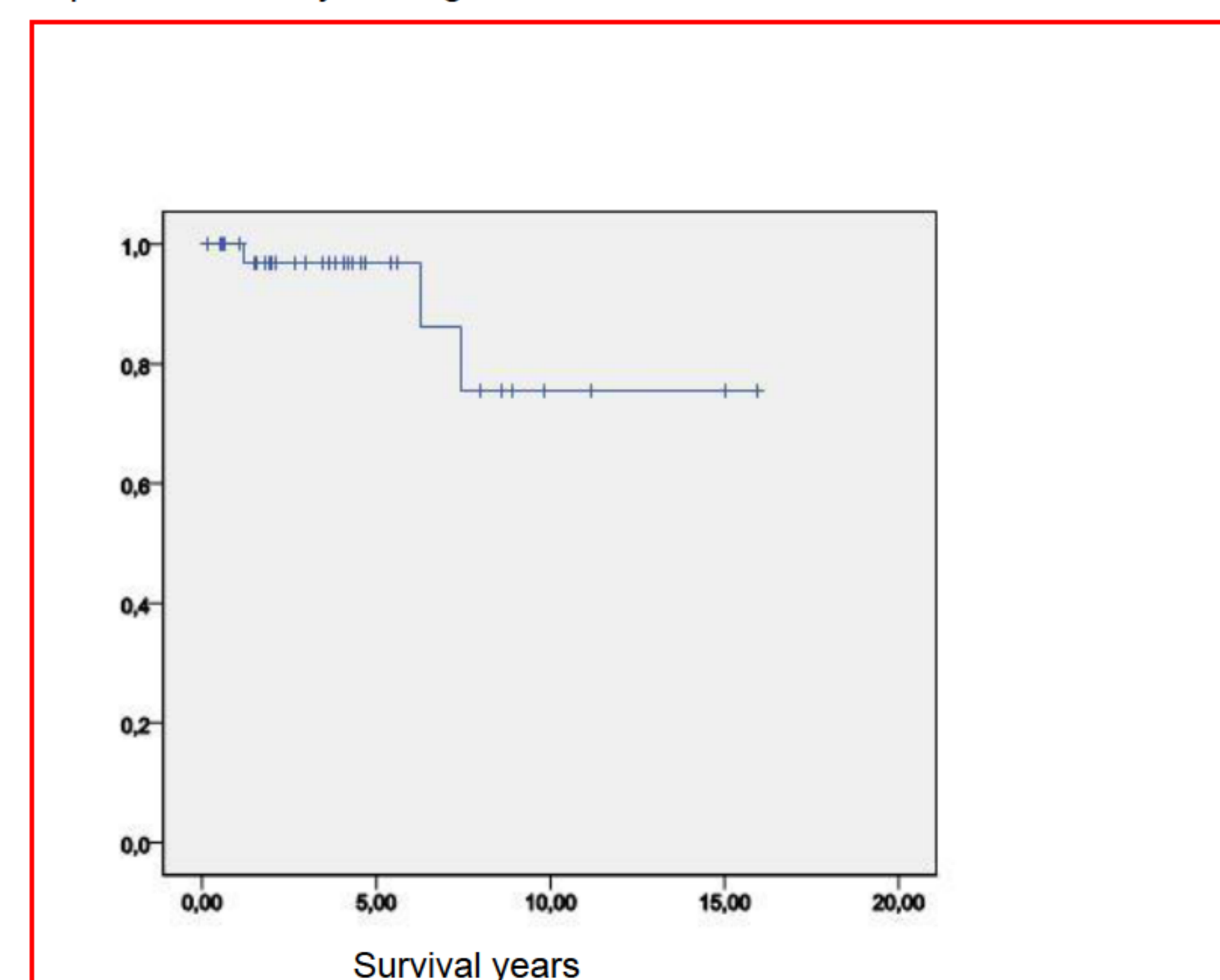
KEEPER: The most frequent keeper profile was consort, in 7 cases (6 wives and 1 husband). We had also 3 mothers, one son and one nurse employed by the patient. We had two patients with no requirement of ESA treatment.

RESIDUAL RENAL FUNCTION: 4 patients kept residual renal function and diuresis higher to 1500 cc after a median 43 (18-64) months.

HOSPITAL ADMISSIONS: we collected 3 hospital admissions: the first one was a cardiac valvular replacement and the patient died. The second was a fistulography and the third was a parathyroidectomy.

5 YEARS SURVIVAL: During a median 43 (18-64) month of follow up, we collected one death, previously described. This fact happened during the 74th month. So, five years survival rate was 100%. Three patients also received a transplant and left the technique.

Kaplan Meier analysis for global survival



CONCLUSIONS

In conclusion, daily home hemodialysis is an available option of renal replacement therapy that should be offered from low clearance clinic as the others therapies.

