CLINICAL, ANALYTICAL AND BIOIMPEDANCE CHARACTERISTICS OF PERMANENTLY OVERHYDRATED HAEMODIALYSIS PATIENTS

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INTRODUCTION

Fluid overload is an important and modifiable cardiovascular risk factor for haemodialysis (HD) patients. Nowadays, we have new tools to assess more objectively the hydration status of the patients as BCM (Body composition Monitor). A relative overhydration (ROH) higher than 15% is associated to higher mortality risk.

AIM

After six months using BCM to monitoring hydration status in 2959 patients, we identify and characterize different parameters in those patients in which we did not achieve a more appropriate hydration state (it is a ROH<15%). On the other hand, we describe the changes in blood pressure (BP) and erythropoiesis-stimulating agents (ESA) related to changes in hydration status.

METHOD

We included 2959 HD patients excluding amputated or unipolar peacemaker carrier patients. We registered parameters of BCM, demographics, analytical, BP and treatment.

We divided patients into two groups according to their changes in ROH: those with a ROH>15% at baseline and after six months of follow-up (N=494) and those with a ROH>15% at baseline but a ROH<15% after six months of monitoring hydration status with BCM (N=325).

The analysis was performed with the SPSS computer program, version 19.
P< 0.05 was considered to indicate statistically significant.

Parameter	Mean	SD
Age (years)	68.20	14.51
Vintage (months)	48.24	43.16
Gender (% males)	62.1	
Vascular access (% catheter)	27.6	
SBP (mmHg)	132.78	20.75
Hb (g/dl)	11.67	1.28
ERI (UI/Kg/week/g/dl)	9.12	8.88
Albumin (g/dl)	3.84	0.39

Table 1. Characteristics at baseline of 2959 HD patients. SBP: systolic blood pressure; Hb: haemoglobin; ERI: erythropoietin resistance index.

RESULTS

We identified those patients in which correcting overhydration were especially difficult classifying them into two population subgroups with huge different characteristics.

On the one hand, co-morbid diabetic males that used a large number of AHD drugs, to whom we applied a very high positive salt gradient during HD sessions. On the other hand, non-diabetic young patients with long vintage, who did not adhere to the treatment or recommendations and also to whom we applied a very high positive salt gradient during HD sessions.

Those patients in which overhydration was corrected, the change was accompanied by a fall in SBP (136.31 ± 20.44 to 129.78 ± 21.42 mm Hg), DBP (65.78 ± 11.71 to 62.87 ± 10.89 mm Hg), and less consume of hypotensive drugs (37.97 ± 47.99 to 32.56 ± 41.69 units per month) as well as erythropoiesis-resistance index (10.92 ± 9.72 a 8.71 ± 8.13 UI/Kg/week/g/dl).

	Diabetic	Non-Diabetic	
	No reduction in ROH after 6m	No reduction in ROH after 6m	
Parameter	**M(SD)/%**	**M(SD)/%**	**P-value**
N	169	325	
Age (years)	65.08 (13.55)	67.31 (14.12)	NS
Vintage (months)	43.44 (35.07)	68.42 (55.05)	0.000
Vascular Ac (catheter, %)	34.7	22	0.009
Gender (males, %)	74.6	66.2	0.05
SBP (mmHg)	144.07 (20.65)	134.32 (23.41)	0.000
LTI (Kg/m²)	11.05 (1.90)	10.93 (2.23)	NS
FTI (Kg/m²)	12.31 (3.92)	11.21 (4.38)	0.006
Albumin (g/dl)	3.75 (0.41)	3.72 (0.48)	NS
Adjusted Charlson CI	6.71 (1.67)	4.95 (1.74)	0.000
Sodium Gradient	1.59 (3.84)	0.08 (2.94)	0.004

Table 2. Characterics at baseline (T_0) in those patients permanently overhydrated after six months of follow-up. LTI: lean tissue index; FTI: fat tissue index.

CONCLUSIONS

A proper control of the hydration state in HD patients requires the knowledge of the patient circumstances (age, comorbidities and treatment). This is a complex process, specially in comorbid diabetic males and non-diabetic young patients with large vintage who did not adhere to recommendations.

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