BODY COMPOSITION ANALYSIS PREDICTS MORTALITY RISK IN HAEMODIALYSIS PATIENTS

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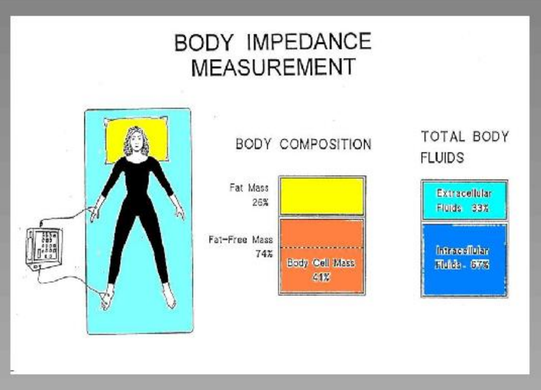
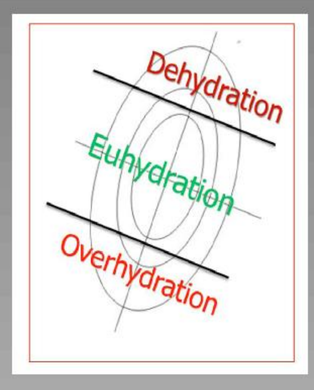
OBJECTIVES

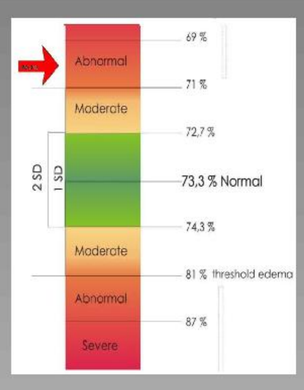
Haemodialysis patients have a high mortality rate, mainly due to cardiovascular disease and malnutrition (1). At the end of the Nineties, some observational studies described a paradoxically correlation between elevated body mass index (BMI) values and longer survival in haemodialysis patients: "obesity paradox" (2). However BMI cannot give information about the alterations in the different body compartments due to protein energy wasting (PEW) (3).
The aim of this study was to evaluate the efficacy of the analysis of body composition by bioimpedence (BIA) to predict the mortality risk in haemodialysis patients.

METHODS

Observational longitudinal study lasting six years on 78 prevalent haemodialysis patients. Every two years, starting from baseline, we collected clinical, laboratory and BIA data, including BIVA analysis and hydratation scale, that is the hydration as percentage of lean body mass. We compared the BIA data of patients dead during the study period with those of survivors. The significance of differences between the mean values of the two groups at baseline was evaluated.





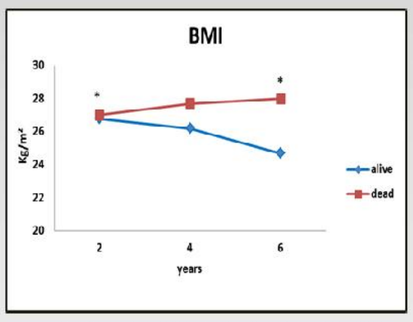


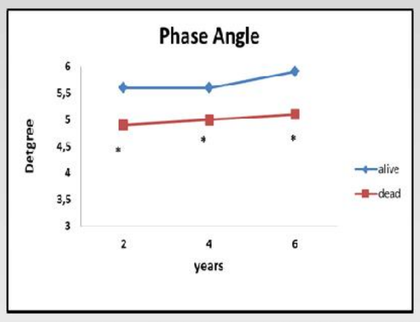
Gender, (n male)	52 (66,7%)
Age, years	65,2±13,7
Dialysis vintage, years	6,8±7,1
Kt/v sp Daug.	1,5±0,3
BMI, Kg/m²	26,8±5,1
sCreatinine, mg/dl	9,9±2,6
sAlbumin, g/dl	4±0,3
CRP, mg/dl	0,94±1,4

Table 1. Clinical data of the 78 maintenance haemodialysis patients

	Alive	Dead	p
Age, years	61±+13,3	70,5±11,8	0,003
Dialysis vintage, years	10,2±9,1	5,3±5,6	0,007
Body Weight, Kg	69,4±11,8	79,5±18,1	0,02
BMI, kg/m²	24,8±3,1	28±6	0,01
Kt/v spDaug.	1,62±0,2	1,5±0,3	ns
sAlbumin, g/dl	4,1±0,2	4,1±3,6	ns
Resistance, Ohm	644,9±100,7	599,1±89,7	ns
Reactance, Ohm	67,3±13,7	53,5±11,7	0,000003
Phase Angle, Detgree	5,9±0,8	5,1±0,9	0,0003
BCMI, Kg/m²	7,91±1,8	7,1±1,7	ns
FMI, Kg/m²	8,4±2,8	11,2±4,1	0,004
ECW, %	46,1±3,6	50,6±5,2	0,0003
Hydratation, %	71,2±3,3	73,3±1,8	0,0006

Table 2. Significance of mean values measured at baseline in the group of deceades (n=45) and alive (n=24).





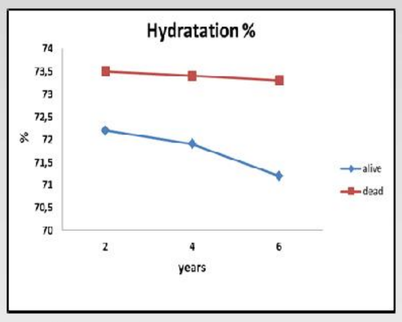


Fig. 1,2,3 Trend of mean values at baseline evalueted at 2, 4 and 6 years and significance of differnces (*p< 0,005).

RESULTS

Nine patients underwent renal transplantation or moved to another haemodialysis facility. The group of patients dead at different times during the six years of observation had significantly higher values of BMI and fat mass index (FMI) compared to the group of survivors, while there were no significant differences regarding the values of body cell mass index (BCMI) and serum albumin. Furthermore they had significantly lower values of electrical reactance, phase angle and the percentage of extracellular water was significantly higher. Finally the BIVA analysis indicated that the percentage of hydration, evaluated by the hydratation scale, was significantly higher in the group of deceased. In summary the group of survivors had normal values of BMI and fat mass, a smaller reduction in BCMI and less fluid overload than the group of deceased patients.

CONCLUSIONS

The survival of haemodialysis patients is influenced by the nutritional status. In particular fluid overload and reduction in muscle mass play a relevant role on survival. The low values of electrical reactance and of phase angle and the high values of hydratation scale predict mortality risk in maintenance haemodialysis patients.

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