MODIFICATIONS OF OVERHYDRATION AND IN ESTIMATIONS OF NUTRITIONAL COMPARTIMENTS USING BIOIMPEDANCE BCM-FRESENIUS MONITOR AFTER DIFFERENT RESTING TIME IN PATIENTS IN PERITONEAL DIALYSIS.

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INTRODUCTION

• Fresenius body composition monitor (BCM) of bioimpedance spectroscopy shows the status of hydration through estimation of overhydration parameter (OH), based on the tissue Chamney´s model of body composition. Then it calculates fat and lean compartments.

• The change from orthostatic to supine position induces significant shifts in fluid distribution from lower limbs to the rest of body, that will modify the measured values of body resistances and reactances.

• AIM: Analyze the influence of resting time before doing the impedance measurements over the estimations of overhydration and fat and lean compartments in peritoneal dialysis patients.

METHODS

• Patients in peritoneal dialysis (CAPD and APD)
• Two impedance measurements:
  • After 2-3 min in supine position.
  • After 30 min in supine position.
• We collected estimations:
  • Overhydration (OH), total body water (TBW), extracellular water (ECW), intracellular water (ICW),
  • Nutritional compartments: lean tissue mass (LTM) and adipose tissue mass (ATM).

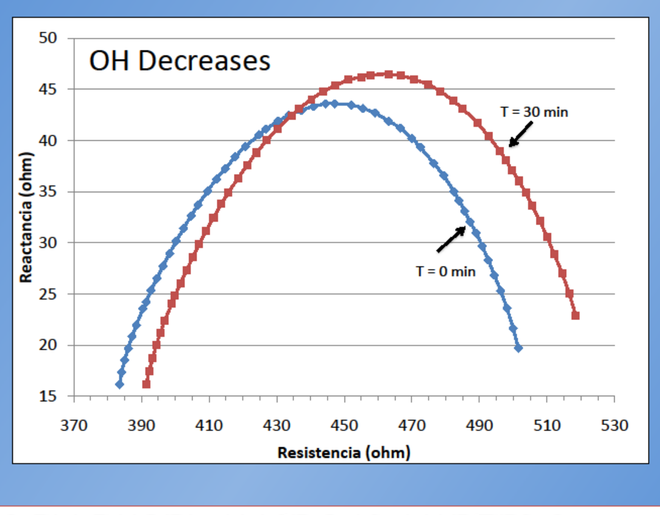
• We compare both measures with paired non-parametric tests.

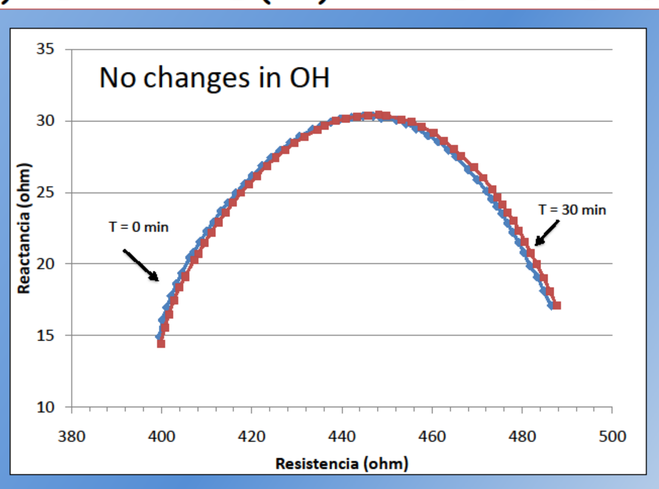
RESULTS

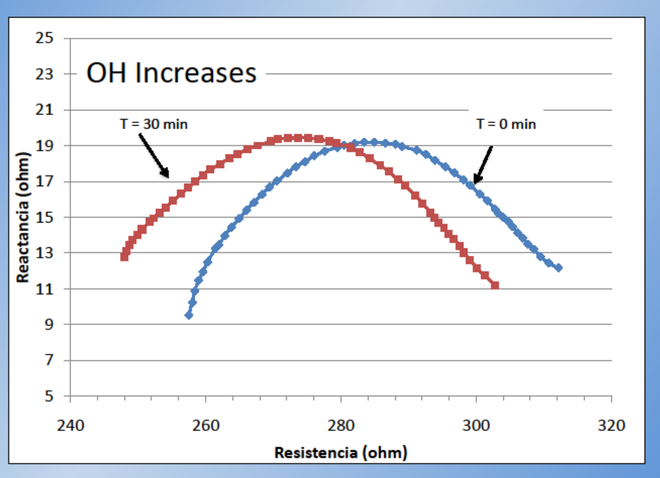
POPULATION CHARACTERISTICS

N	37
Age	60±20
Months in PD	29±32
Months in APD	25±26
Gender (men)	20 (54,1%)
CAPD / APD	20 / 17
Weight (Kg)	72,5±13,2
BMI (Kg/m^2)	27,7±4,6

SHIFTS OF RESISTANCE (R)-REACTANCE (Xc) CURVES AFTER DIFFERENT RESTING TIME



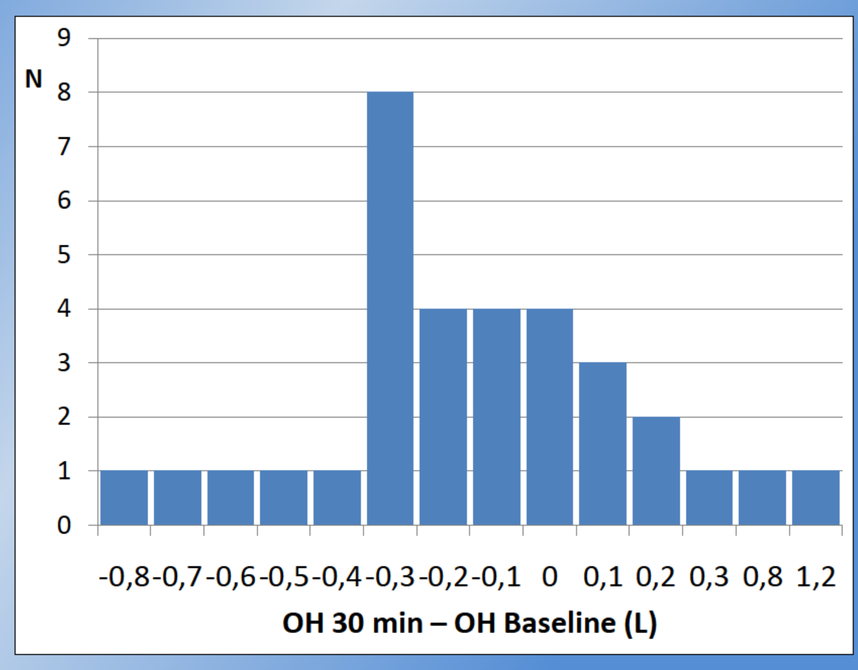




CHANGES IN IMPEDANCE PARAMETERS

	Baseline	Variation after 30 min x±ds	Rank	p
R 5 KHz	547±86	11,1±9,9	-9,4 a 35,1	<0,001
Xc 5 KHz	22,9±6,1	0,77±0,02	-3,48 a 4,09	0,010
Phase angle 5 KHz (º)	2,40±0,50	0,02±0,16	-0,50 a 0,28	0,44
R 50KHz (ohm)	492±77	8,0±8,4	-9,7 a +25,7	<0,001
Xc 50 KHz (ohm)	43,0±10,9	1,16±1,15	-0,80 a 3,91	<0,001
Phase angle 50 KHz (º)	5,00±1,00	0,04±0,12	-0,17 a +0,34	0,016
R 1000 KHz (ohm)	426±68	7,5±8,6	-9,6 a 29,4	<0,001
Xc 1000 KHz (ohm)	20,1±9,0	-0,2±5,7	-14,0 a 18,9	0,812
Phase angle1000 KHz (º)	2,68±1,11	-0,07±0,77	-1,84 a +2,20	<0,001
Intracellular R (ohm)	1565±389	19±85	-134 a +296	0,182
Extracellular R (ohm)	568±89	12±11	-13 a +40	<0,001

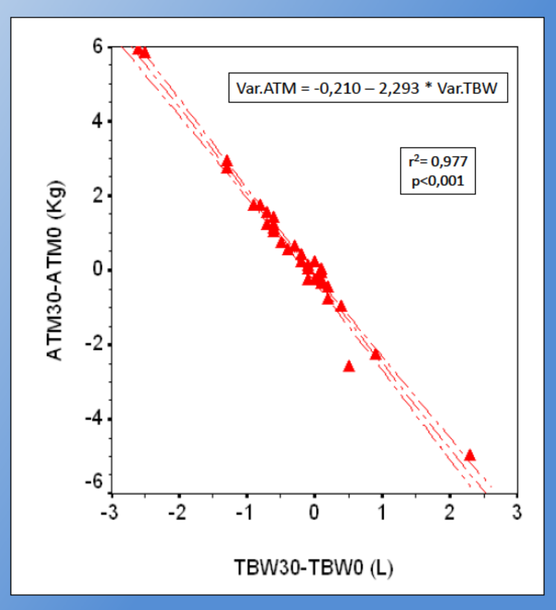
VARIATION OF OVERHYDRATION (OH)

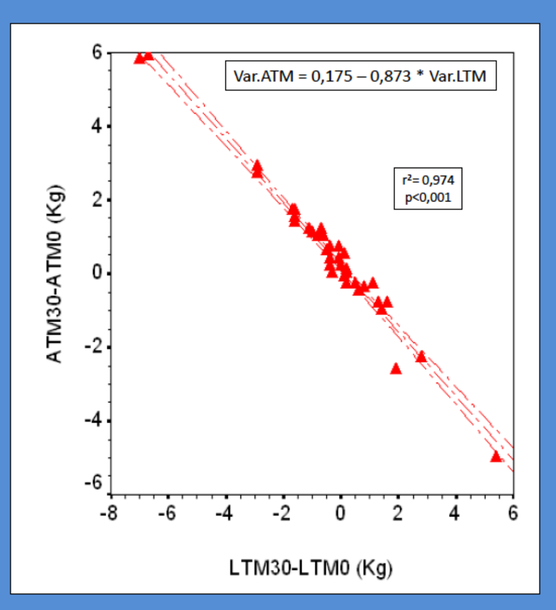


CHANGES IN ESTIMATIONS OF NUTRITIONAL COMPARTMENTS

	Baseline	Variation after 30 min x±ds	Rank	p
OH (L)	1,28±1,57	-0,15±0,39	-0,80 a +1,20	0,021
OHr (%)	7,05±9,02	-0,93±2,23	-4,3 a +5,8	0,016
TBW (L)	34,09±6,37	-0,32±0,83	-2,60 a +2,30	0,024
ECW (L)	16,44±3,16	-0,19±0,20	-0,50 a +0,50	<0,001
ICW (L)	17,65±3,57	-0,13±0,76	-2,50 a + 1,90	0,309
LTM (Kg)	34,94±8,61	-0,40±2,17	-7,0 a +5,4	0,267
BCM (Kg)	19,26±5,81	-0,28±1,56	-5,10 a +3,80	0,277
ATM (Kg)	35,76±11,76	0,53±1,92	-5,0 a +5,9	0,104
FAT (Kg)	26,29±8,63	0,39±1,40	-3,6 a +4,30	0,103

VARIATION IN ADIPOSE TISSUE MASS (ATM) WITH MODIFICATIONS OF TOTAL BODY WATER (TBW) AND LEAN TISSUE MASS (LTM)





CONCLUSIONS

•After different times of resting it occurs a significant redistribution of fluids from lower limbs to rest of the body that changes bioimpedance parameters and estimations of body water volumes.
•A measurement taked within few minutes after supine position will inflate estimation of extracellular cell volume and the overhydratation OH parameter, inducing important errors in estimations of nutritional compartments (adipose tissue mass and lean tissue mass).
• It is necesary to perform measurements of bioimpedanciometry using a standarized time of resting and after a minimum time of 5-10 minutes, to get reproducible results and to reduce impact of overhydration of lower limbs on estimations of body compartments.

52 ERA
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L2) Dialysis. Peritoneal dialysis.
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DOI: 10.3252/pso.eu.52era.2015
ePosters supported by F. Hoffmann- La Roche Ltd.
52 ERA EDTA CONGRESS London 2015
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