

DIFFERENCES IN HYDRATION STATUS BETWEEN HEALTHY, PRE-ESRD, DX AND TX SUBGROUPS CAN BE DISTINGUISHED CLEARLY WITH BIOIMPEDANCE SPECTROSCOPY

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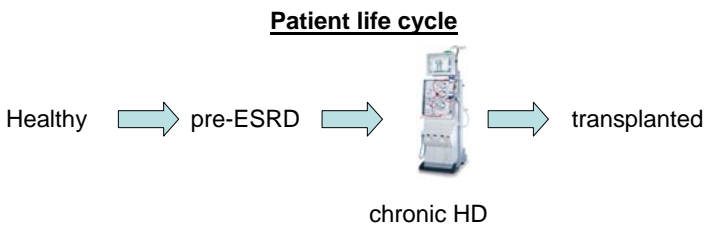
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1. AIM OF THE STUDY

- To analyze the fluid status in different patient subgroups
- Determine development of fluid status over the patient lifecycle

2. STUDY DESIGN

- Retrospective analysis
- Four different groups, 200 subjects, 50 exclusive to each group
- Groups were similar in age and BMI
- No adjustment was made for duration of group membership at time of measurement because of insufficient number of data



Group	Description	#	Age [yrs]	BMI (kg/m ²)
A	Healthy	50	49 ± 5	26.3 ± 4.6
B	Pre ESRD	50	50 ± 9	27.5 ± 6.6
C	Chronic HD	50	50 ± 2	26.3 ± 5.1
D	Transplanted	50	49 ± 14	24.8 ± 3.8

3. METHODS

Bioimpedance spectroscopy (BIS) measurements

- BIS-Device: BCM-Body Composition Monitor (Fres. Med. Care)
- 50 frequencies from 5 kHz to 1 MHz
- Measurements taken before treatment



Determination of ECW and ICW

- New BIS-equations corrected for body composition
- Published in *Physiol Meas* 2006 [1]
- Validated by gold standard dilution (n=152 subjects)

Determination of Overhydration

- 3C body composition model (ATM, LTM, OH)
- Published in *AJCN* 2007 [2]
- Clinical data of 6.000 patients, >10.000 measurements

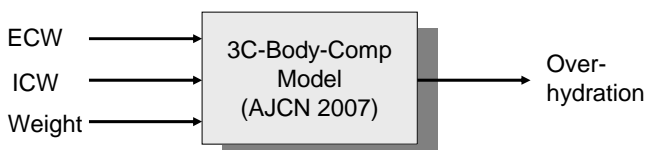


Figure 1. Diagram of the body composition model (ECW = extracellular water, ICW = intracellular water).

4. RESULTS

- **Healthy subjects:** Overhydration in 50 healthy subjects is centred around zero (-0.2 ± 0.9 L). The scatter arises from normal day to day variations in hydration status.
- **pre-ESRD:** OH is higher in preESRD as compared to healthy subjects (1.1 ± 2.1 L)
- **Chronic HD:** Increasing trend in overhydration from healthy to CHD (1.7 ± 2.0 L)
- **Transplanted:** Overhydration in transplanted patients is reduced in comparison with chronic HD (0.6 ± 1.2 L)

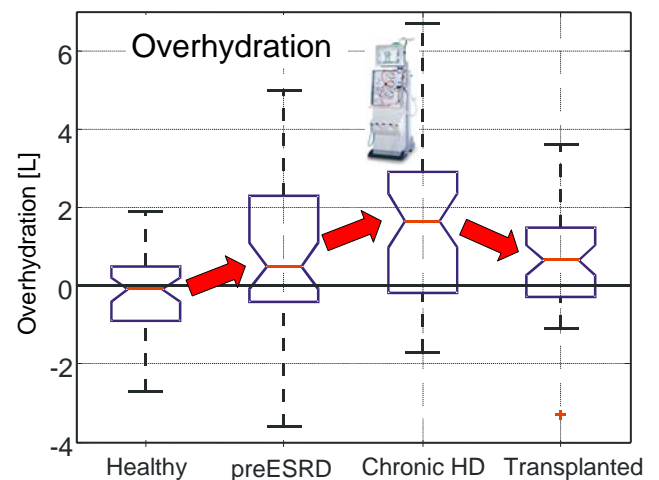


Figure 2. Overhydration in four different subject groups. Each group includes 50 different subjects. Care was taken that the groups were similar in age and BMI. OH increases from healthy to CHD and decreases again after transplantation.

5. CONCLUSIONS

- Findings for different groups are plausible
- BIS in combination with a suitable body composition model is an effective method for objective determination of fluid status
- Overhydration is significantly higher in pre-ESRD and chronic HD patients than in healthy subjects
- Transplantation improves fluid status

6. REFERENCES

- [1] U. Moissl et al., "Body fluid volume determination via body composition spectroscopy in health and disease", *Physiol. Meas.* 27 (2006)
- [2] P. Chamney et al., "A whole-body model to distinguish excess fluid from the hydration of major body tissues", *Am J Clin Nutr.* 85 (2007)

7. APPENDIX:

Explanation of boxplots

