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Abstracts

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be rather difficult challenge. BCM (Body Composition Monitor) represents a new instrumental method to assess the "normohydratation" status. **Aim:** To assess the hydratation status using BCM and to compare it with US-VCI method (ultrasound measurement of vena cava inferior collapsible index after HDF), BVM (Body Volume Monitor) and the clinical status. **Methods:** during one single HDF treatment we performed measurements using BCM (multifrequency bioimpedance spectroscopy), US-VCI and BVM (ultrasound on line hematocrit measurement and evaluation of RBV/relative blood volume/ curve during HDF). The results were compared and correlated with objective clinical status. All pts were on maintenance (>90 days) on-line post-dilution HDF using F5008 monitor. **Results:** 38 pts, M/F ratio 71/29%, mean age 70.8 yrs (±15), mean treatment time 29 months (4–114 months), 35% were diabetics. Average intradialytic weight gain was 2.15 kg and hypertension had 32% pts (BP>140/90 mmHg before HDF). The percentage of hyper/normo/hypohydratation pts was 24/55/21% according to BCM and 11/78/11% according to US-VCI, respectively. Positive correlation between BCM and US-VCI results was found in 77%. When light hyperhydratation was found by BCM, the normo/hypohydratation according to US-VCI was found in 8% of pts. In BVM, the RBV curve corresponding with intravascular (IVC) hypovolemia was found in 13%, but 80% out of these pts were assessed as normo/hyperhydratation by both BCM and US-VCI. When normohydratation was found by both BCM and US-VCI, the mean value of RBV was 87.5%. **Conclusions:** 1/BCM seems to be a method with good correlation to clinical hydratation status; 2/ discrepancy between the RBV hypovolemia curve vs. BCM/US-VCI normo/hypervoleamia is probably due to poor or prolonged refill of IVC during or after HDF treatment, despite of relative interstitial hyperhydratation.

O9

Assessment of Fluid Status in Dialysis Patients by Means of Terahertz Spectroscopy

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Objectives: Reliable assessment of fluid status in haemodialysis (HD) patients is a persisting problem. Recently, terahertz time-domain spectroscopy (TDTS) was used to identify cancerous tissue, based on its different water content and strong interaction of water molecules with THz radiation. This study tried for the first time to apply TDTS for assessment of fluid status in HD patients. **Method:** TDTS (80 MHz pulses in frequency region of 0,2–1,5*10^{12} Hz) measurements were performed in 10 stable HD patients prior to and after 2 HD sessions, one after 3 days and one after 2 days interval. From the reflected THz pulse, the phase shift φ and amplitude rescaling factor ***r*** were evaluated at 2 sites on volar forearm and tip of the ring-finger (non-access arm). Pre-HD vs. post-HD changes in φ and ***r*** values were evaluated and compared with fluid volume (UF) removed during HD and changes in excess fluid evaluated by bioimpedance spectroscopy (BCM, Fresenius). **Results:** During most of the investigated HD sessions the amplitude factor ***r*** measured at the forearm increased (by 2 to 38%), changes at the finger-tip were far less pronounced. Changes in φ with UF were clearly visible in some patients, but negligible in others. Crosscorrelation in both ***r*** and φ measured at different locations was quite good, the proportioning coefficient was however always far from 1.0, suggesting differing tissue properties in different measuring sites. The weakest statistically insignificant correlations were seen between the changes in φ and ***r*** and conventional markers of fluid status changes (BCM-measured overhydration and UF), although there was a clear impact of small number of measurements (R-value doubled when data of two "outlier" patients were excluded). **Conclusions:** This very first small-scale study demonstrated measurable changes in TDTS parameters pre- vs. post-HD. Unsatisfactory correlations of those changes with changes in fluid status call for testing other skin measurement sites and/or modifying the skin conditions.

O10

Value of Serum Biomarkers in the Assessment of Bone Turnover, Mineralization, and Volume in Hemodialysis Patients

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Objectives: We investigated value of serum bone markers for assessment of bone turnover (T), mineralization (M), and volume (V) in hemodialysis (HD) patients. **Methods:** Bone biopsy (BB) was done after tetracycline double labeling in 218 prevalent HD patients. Mean age was 57±14 year, HD duration 53±45 months. T, M, and V were assessed by static and dynamic measurements at standardized sites in cancellous bone using the semi-automatic method (Osteoplan II). Intact PTH levels were measured by IRMA (Scantibodies); bone alkaline phosphatase (BAP), cross-linked N-telopeptide of type 1 collagen (NTx), tartrate-resistant acid phosphatase (TRAP), osteoprotegerin and RANKL levels were measured by ELISA in blood samples obtained at the time of BB. ANOVA and multivariate analysis were done. **Results:** Of all BB specimens (BBs), 58% of BBs labeled with tetracycline was diagnosed as low-T, 17% as high-T. Frequency of the patients with normal/high-V was 56%. Defective mineralization was found in only 5 patients; none of them had low T. In patents with high-T, mean PTH, ALP, NTx, BAP, and TRAP levels were significantly higher, OPG/RANKL ratio lower, compared to those with low-T. BAP, NTx, TRAP and ALP levels were significantly higher in patients with defective mineralization. Only NTx levels demonstrated a correlation with V. In multivariate analysis adjusted for age, gender, presence of diabetes, HD duration, only age and serum NTx were significantly predictive for T [CI: 1.003 (1.001–1.005), $p<0.01$]. None of the markers studied was predictive for V and M. **Conclusion:** Bone turnover can be better predicted by BAP, NTx, and ALP than PTH. No marker was found for prediction of V. The low number of patients with defective M does not lend itself for analysis.