

P1442 **CAN THE ASSESSMENT OF ULTRASOUND LUNG WATER IN HEMODIALYSIS PATIENTS BE SIMPLIFIED?**

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**Background and Aims:** Lung Ultrasound (US) reliably estimates lung water and it is increasingly applied in clinical practice in dialysis patients. Lung water is currently measured by applying a semi-quantitative US score summing up the US-B lines (an equivalent of B lines in standard X-rays of the thorax) detected in 28 lung intercostal spaces (LIS) (Jambrik Z et al., Am J Cardiol 2004; 93:1265-70). A simplified assessment restricted to 8 LIS only (Gutierrez M et al., Arthritis Research & Therapy, 2011;13:R134) has been proposed. However, the agreement among this simplified score and the reference score has not been studied and the prognostic value of the simplified score (8-LIS) has not been face to face compared with the 28-LIS score.

**Method:** We included in the analysis in a cohort of 303 hemodialysis (HD) patients in which the pre-dialysis US-BL score was measured at baseline with both the semi-quantitative by Jambrik and the simplified Gutierrez method. The time needed for performing the 28-LIS and the 8-LIS score by six independent assessors with various experience -from low to high- on lung US assessment was accurately measured and recorded. Patients were divided into 4 categories, according to pre-established cut-offs specific for the two methods (28-LIS score: <5; 6-15; 16-30; >30 US-BL; 8-LIS score: <10; 11-20; 21-50; >50 US-BL) The prediction power of these scores for death and fatal and non-fatal cardiovascular events was assessed by the explained variance (R<sup>2</sup>).

**Results:** The 28-LIS score and the 8-LIS score were highly inter-related (Spearman's  $\rho=0.93$ ,  $P<0.001$ ). During a mean follow-up of 3 years, 112 patients died and 129 experienced a CV event. At univariate and multivariate analysis, both scores were associated to the study outcomes (Tab.1). The explained variance (R<sup>2</sup>) of the 28-LIS score for death was 4.1% and that for CV events 4.6%. The corresponding R<sup>2</sup> of the 8-LIS score were 5.4% (death) and 4.7%, (CV events), to values close to those of the 28-LIS score. Accordingly, when the two scores were separately added to a clinical model including easily available clinical variables (age, gender, smoking, diabetes, cardiovascular comorbidities, cholesterol, arterial pressure, BMI, anti-hypertensive treatment, NYHA class as well as dialysis vintage, hemoglobin, albumin, phosphate and CRP) the R<sup>2</sup> of the model including the 28-LIS score (death: 31.1%; CV events: 23.9%) were again very similar to those of the 8-LIS score (30.7% and 23.1%, respectively). The median time needed to perform the examination was 3:05 min (IQR 2:22 – 5:00 min) for the 28 LIS score and 1:35 min (IQR 1:16 – 2:00 min) for the 8 LIS score.

**Conclusion:** The simplified Gutierrez 8-LIS score is tightly related to the classical Jambrik 28 LIS score and the two scores hold an almost identical predictive power. Even though the 28-LIS score demands less than 5 minutes, the 8-LIS score can be done in only about 90 sec. and it is therefore better suited for application in everyday clinical practice in hemodialysis units.

Tab.1 Cox Regression analysis showing the association of semi-quantitative and simplified score with the considered outcomes

|                           | Univariate analysis<br>HR (95%CI), P | Multivariate analysis<br>HR (95%CI), P |
|---------------------------|--------------------------------------|--|
| <b>Outcome: death</b>     |                                      |  |
| Semi-quantitative score   | 1.24 (1.04-1.47), P=0.01             | 1.23 (1.02-1.49), P=0.03               |
| Simplified score          | 1.38 (1.12-1.69), P=0.002            | 1.33 (1.06-1.67), P=0.02               |
| <b>Outcome: CV events</b> |                                      |  |
| Semi-quantitative score   | 1.26 (1.07-1.47), P=0.004            | 1.23 (1.03-1.46), P=0.02               |
| Simplified score          | 1.34 (1.11-1.62), P=0.002            | 1.23 (1.00-1.52), P=0.05               |

Figure: