A67 PREDICTING LUNG FUNCTION DECLINE IN SYSTEMIC SCLEROSIS (SSC)

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Purpose Pulmonary involvement is common and a lead cause of mortality in SSc, but progression to end-stage restrictive lung disease is variable and predictors of rapidly progressive lung function decline are unknown. As treatment for lung disease carries significant toxicity there is a pressing need for biomarkers to predict which patients are most likely to suffer rapid decline. Surfactant-D (SP-D), a glycoprotein expressed in the terminal airways of the lungs, is an indicator of early pulmonary damage and correlates with lung function in SSc. It is not known if SP-D levels correlate with the rate of change in lung function and predicts a rapid decline in lung function.

Methods Baseline serum from SSc patients enrolled in a multicentre cohort who had at least 2 pulmonary function tests (PFTs), separated by a year, was analysed for SP-D levels by ELISA. Levels were correlated with: (1) the annual rate of change in percent (%) predicted forced vital capacity (FVC) and % predicted carbon monoxide diffusing capacity (DLCO) on PFT; and (2) a rapid decline in lung function (rapid progressors), defined as an annual rate of decline in % predicted FVC at a rate twofold faster than the general population ($>2\%/year$). Results are reported as mean $\pm$ SD.

Results Sixty-seven SSc patients with an age of 54.5 ± 12.1 years, disease duration of 8.6 ± 7.3 years, with serial PFTs had a follow-up period of 32.7 ± 11.7 months between PFTs. The study group comprised of 59 women, 90% Caucasian, 13% active current smokers, 40 diffuse and 27 limited cutaneous SSc; 18 and 17 had positive anti-centromere and anti-topoisomerase antibodies, respectively. The % predicted FVC and DLCO at baseline were $94.2 \pm 26.8\%$ and $71.8 \pm 23.0\%$, respectively. The annual rate of change in % predicted FVC and DLCO was $-2.9 \pm 13.4\%/year$ and $-3.3 \pm 7.7\%/year$, respectively; 63% were rapid progressors. SP-D levels among rapid progressors were 237.9 ± 176.7 ng/ml, significantly higher than non-rapid progressors levels of 173.5 ± 95.1 ng/ml ($p=0.02$).

There was a significant, inverse correlation between SP-D levels with annual rate of change in % predicted FVC ($r = -0.27$, $p=0.03$), but not in DLCO. SP-D levels significantly predicted rapid progressors ($p=0.03$). Age, gender, disease duration, anti-Scl 70 antibody status, smoking status, scleroderma subtype, restrictive lung disease at baseline, radiographic findings of ILD at baseline were not associated with rapid progression. When adjusted for age, smoking status, disease duration, SP-D, and scleroderma subtype, SP-D [OR=1.5 per 100 unit change, 95% CI of 1.09 to 1.10, $p=0.02$] and active smoking [OR=3.7, 95% CI of 1.008 to 13.4, $p=0.05$] was significantly associated with rapid progressors.

Conclusion Baseline SP-D levels significantly correlate with the annual rate of decline in % predicted FVC. After adjusting for age, disease duration, and scleroderma subtype, active smokers and levels of SP-D predict a rapid progression of lung function decline. SP-D may be useful in identifying a high risk group of SSc patients for closer monitoring and therapeutic intervention.