

European Respiratory Society Annual Congress 2012

Abstract Number: 1730

Publication Number: P464

Abstract Group: 6.1. Epidemiology

Keyword 1: Respiratory muscle **Keyword 2:** Gas exchange **Keyword 3:** Spirometry

Title: Respiratory function in elderly with 'senile' or 'juvenile' pulmonary phenotype: Results from the KORA-Age study

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Body: Background: Lung function, typically assessed by spirometry, is a strong predictor for overall morbidity and mortality. To improve our mechanistic understanding we examined whether poor spirometric lung function is associated with general respiratory limitations in elderly subjects with apparently healthy lungs. Methods: Spirometry was performed in a random population sample from the region of Augsburg, Germany (n=935, aged 65-90y). From subjects free of lung disease (COPD, Asthma) two subgroups with either poor ('senile'; n=87) or favourable ('juvenile'; n=82) lung function were selected from the lower and upper 10% of the FEV1%pred distribution. TLC, DLCO, peak inspiratory pressure at RV (Pimax), the decrease in airway pressure at 0.1s (P01), and 6MWD were determined. Results: P01 and P01/MV were not affected by age, while spirometric values, DLCO/VA and Pimax showed an age dependent decline. 'Senile' phenotype subjects had 10% lower DLCO (p<0.05), while DLCO/VA was not affected. P01, P01/MV and P01/Pimax were increased by at least 45% and Pimax reduced by 13% in the 'senile' group (p<0.05). Multiple regression analysis in 'senile' and 'juvenile' subjects revealed that limitations in DLCO and Pimax contribute to a reduced 6-MWD. Discussion: Elderly subjects with poor spirometry, while being free from overt lung disease, also suffer from age related limitations in gas exchange capacity, reduced muscle strength, and increased workload during breathing. This limited respiratory capacity may contribute to reduced physical fitness and morbidity. Supported by German Federal Ministry of Education and Research (BMBF FKZ 01ET0713) as part of the 'Health in old age' program.