

European Respiratory Society Annual Congress 2013

Abstract Number: 616

Publication Number: P2263

Abstract Group: 1.3. Imaging

Keyword 1: Imaging **Keyword 2:** Smoking **Keyword 3:** Biomarkers

Title: Computed tomography in screening for smoking induced emphysema

Dr. Martin 3797 Anderson Martin.Anderson@sodersjukhuset.se MD ^{1,2}, Dr. Gunnar 3798 Engström gunnar.engstrom@med.lu.se ³, Dr. Lars 3799 Nordenmark Lars.Nordenmark@astrazeneca.com ⁴, Dr. Dag 3800 Mohlkert dag.mohlkert@sodersjukhuset.se MD ⁵, Dr. Elmira 3801 Rouzbeh elmira.rouzbeh@sodersjukhuset.se MD ⁵, Dr. Maria 3802 Gerhardsson de Verdier Maria.Gerhardsson@astrazeneca.com MD ⁴, Dr. Ulf 3803 Nihlén Ulf.Nihlen@astrazeneca.com MD ^{4,6}, Dr. Thomas 3804 Fehniger thomas.fehniger@telia.com MD ⁷, Dr. Magnus 3805 Dahlbäck Magnus.Dahlback@astrazeneca.com ⁴ and Prof. Magnus 3806 Svartengren Magnus.Svartengren@ki.se MD ¹. ¹ Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden ; ² Department of Clinical Physiology, South Central Hospital, Stockholm, Sweden ; ³ Dept of Clinical Sciences, Lund University, Malmö, Sweden ; ⁴ INR Global Medicine Development, AstraZeneca R&D Mölndal, Mölndal, Sweden ; ⁵ Department of Radiology, South Central Hospital, Stockholm, Sweden ; ⁶ Department of Respiratory Medicine and Allergology, Lund University, Lund, Sweden and ⁷ Division of Clinical Protein Science & Imaging, Dept. of Measurement Technology and Industrial Electrical Engineering, Lund University, Lund, Sweden .

Body: Computerized methods and visual assessment of computed tomography (CT) scans were compared in a subsample of a population based twin study to explore the relationships between emphysema, smoking, decreased pulmonary function, and elastin degradation products. 138 twins were investigated. Two radiologists classified the CT-scans by presence of Centrilobular Emphysema (CE). PD15 (i.e. the cut off value in Hounsfield units [HU] for the 15% darkest areas) as well as fixed HU limits were used in the computerized analyses. Lung function and urinary desmosines were measured by specialist laboratories. There was no significant relationship between PD15 and current smoking or pack-years. Low C-reactive protein and body-mass-index were associated with low PD15 ($p < 0.01$ for both). Also sex was significantly associated with PD15. Of the lung function measures, FEV1/FVC (low values) and FVC (high values) were associated with low PD15. Associations between these measures and CT findings were strongest for the upper third of the lung. 106 of the 138 twins had CE, 27 had not CE. Five subjects were omitted due to poor quality and technical problems. In the CE group FEV1 % pred. was lower ($p = 0.018$), as was the FEV1/FVC-ratio and DLCO (both $p < 0.001$), further, CRP was higher ($p = 0.014$) and U-desmosines showed a tendency to be higher ($p = 0.054$). The proportion with CE was associated with PD15. In this population based study on mild COPD, the lung function and biomarker parameters of disease were closer associated to visual scoring of emphysema than to quantitative CT measurements. If quantitative measures should be used for staging and phenotyping smoking induced emphysema, such measurements should be focused on

the upper third of the lungs.