Obstructive lung disease

Occupational exposures, smoking and airway inflammation

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin, Göteborgs Universitet kommer offentligen att försvaras i Arvid Carlsson, Medicinaregatan 3, Göteborg.

Fredagen 24 februari 2017 kl 09:00

av

Nicola Murgia

Fakultetsopponent:

Professor Isabella Annesi-Maesano

INSERM

Paris

Avhandlingen baseras på följande delarbeten:

I. **Murgia N**, Brisman J, Claesson A, Muzi G, Olin AC, Torén K. Validity of a questionnaire-based diagnosis of chronic obstructive pulmonary disease in a general population study. BMC Pulm Med 2014;14:4.

II. **Murgia N**, Schiöler L, Torén K, Olin AC. Exhaled nitric oxide at different flow rates is a predictor of new-onset wheeze and asthma in a general population. 2016 (submitted)

III. Torén K, **Murgia N**, Schiöler L, Bake B, Olin AC. Reference values of fractional excretion of exhaled nitric oxide among non-smokers and current smokers. 2016 (submitted).

IV. **Murgia N**, Brisman J, Dahlman-Höglund A, Andersson E, Olin AC, Torén K. Occupational risk factors for airway obstruction in a population-based study in Northern Europe (in manuscript).

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Abstract

Obstructive lung disease is a group of respiratory diseases characterized by airways obstruction. Among them the more frequent are asthma and chronic obstructive pulmonary disease (COPD). Obstructive lung diseases are caused by a complex interaction between environmental exposure (e.g. smoking, occupational, allergens, air pollution) and genetic predisposition. Obstructive lung diseases are usually characterized by airway inflammation. Fractional exhaled nitric oxide (FeNO) is one method to study eosinophilic airway inflammation. Population based survey have been used extensively to study obstructive lung disease; however, some concerns have been raised because their design and methodology. The overall aim of this thesis is to evaluate the effectiveness of a population based survey in Western Sweden to study several aspects of obstructive lung diseases. One aspect is the diagnostic accuracy of questionnaire items in defining airway obstruction by questions regarding diagnosis of COPD and chronic bronchitis symptoms. In this thesis, the sensitivity of these questions in catching airway obstruction was low, while specificity was very high, indicating that participants reporting a medical diagnosis of COPD have a high likelihood of having airway obstruction. Another aspect is the role of subclinical airway inflammation, assessed by FeNO, in predicting obstructive lung diseases. In asymptomatic subjects, high FeNO was associated to new onset asthma and wheezing in a follow-up. Given the importance of FeNO in obstructive lung diseases, this population was also investigated to provide reference values of FeNO, which can be very useful in surveys and clinical practice to discriminate between normal and abnormal findings. Finally, this population was explored to assess potential risk factors for airway obstruction. The results confirmed the role of smoking and atopy as a risk factors, while occupational exposure to vapours, dust, gas and fumes, assessed by a job exposure matrix, seems to play a role especially when coupled to smoking exposure. All the results, despite some limitations, confirm that large population based studies are still useful for exploring different aspects of obstructive lung disease.