238. The burden of work-related respiratory disease: known and new end-points

1902

Occupational exposures and airway obstruction in the burden of obstuctive lung disease (BOLD) study

Peter Burney[1], Bernet Kato[1], Bernd Lamprecht[2], Louie Idolor[3], Amund Gulsvik[4], Sonia Buist[5]. *[1]National Heart Lung Institute, Imperial College, London, United Kingdom; [2]Department of Pulmonary Medicine, Paracelsus Medical University, Salzburg, Austria; [3]Philippine College of Chest Physicians, Philippine College of Chest Physicians, Manilla, Philippines; [4]Department of Thoracic Medicine, University of Bergen, Bergen, Norway; [5]Department of Medicine, Oregon Health and Sciences University, Portland, OR, United States*

Introduction: Occupational exposures are a recognised cause of respiratory morbidity but there are few population based estimates of their effects on lung function.

Methods: The Burden of Obstructive Lung Disease programme undertook post-bronchodilator spirometry in representative samples of people over the age of 40 years in 15 sites (N=14,400). It also collected information on occupation, including employment in specific industries, with the length of employment in each. Named industries were classified into three exposure groups: Fumes (F), Inorganic dusts (ID) and Organic dusts (OD). Odds ratios were estimated compared with the unexposed population adjusting for sex, age, smoking, pack-years, height and education, first for any exposure and then for length of exposure. Meta-analytical methods were used to combine risks between sites. COPD was defined as a FEV_1/FVC ratio < Lower Limit of Normal.

Results: 10% were exposed to F, 9% to ID and 24% to OD. COPD was more common in those exposed; (OR (95%CI)) for F=1.80 (1.29, 2.53), for ID=1.51 (1.03, 2.22) and for OD=1.27 (0.96, 1.69). However much of the excess risk was seen in those exposed for less than a year. The risks (OR (95%CI))/ten years exposure after the first year were F: 1.03 (0.87, 1.21); ID: 0.90 (0.75, 1.07); OD: 1.06 (0.94, 1.20). After stratification the estimated OR from OD in non-smokers was possibly raised, but not significantly, at 1.26 (0.97, 1.64) per 10 years exposure.

Conclusions: Estimates of effects were probably strongly influenced by a healthy worker effect. Further data are needed and are being collected.

1903

Occupational exposure to dusts, gases, and fumes and incidence of COPD in SAPALDIA

Amar Mehta[1,2], David Miedinger[3,4], Dirk Keidel[1,2], Robert Bettschart[5], Andreas Bircher[6], Pierre-Olivier Bridevaux[7], Ivan Curjuric[1,2], Hans Kromhout[8], Nicole Probst-Hensch[1,2], Thomas Rothe[9], Erich W. Russi[10], Tamara Schikowski[1,2], Christian Schindler[1,2], Joel Schwartz[11], Roel Vermeulen[8], Thierry Rochat[7], Nino Kuenzli[1,2]. *[1]Chronic Disease Epidemiology Unit, Swiss TPH, Basel, Switzerland; [2]Department for Public Health, University of Basel, Basel, Switzerland; [3]Occupational Medicine, SUVA, Luzern, Switzerland; [4]Department of Internal Medicine, University Hospital, Basel, Switzerland; [5]Lungen Zentrum, Hirslanden Klinik, Aarau, Switzerland; [6]Department of Dermatology, University Hospital, Basel, Switzerland; [7]Division of Pulmonary Medicine, University Hospitals of Geneva, Geneva, Switzerland; [8]Environmental Epidemiology, Institute for Risk Assessment Sciences, Utrecht, Netherlands; [9]Department of Internal Medicine and Pneumology, Zuercher Hoehenklinik Davos, Davos Clavadel, Switzerland; [10]Department of Pneumology, University Hospital Zurich, Zurich, Switzerland; [11]Department of Environmental Health, Harvard School of Public Health, Boston, United States*

Objective: We evaluated if occupational exposures were associated with increased incidence of chronic obstructive pulmonary disease (COPD) in the Swiss Cohort Study on Air Pollution and Lung and Heart Diseases in Adults (SAPALDIA).
Methods: Pre-bronchodilator ratio of forced expiratory volume in one second over forced vital capacity (FEV_1/FVC) was measured in 4,551 non-asthmatic participants (ages 18 to 64) in SAPALDIA at baseline in 1991 and at follow-up in 2001-2003. COPD was defined as FEV_1/FVC < lower limit of normal (LLN, predictions according to the Quanjer spirometric reference equation). Using a job-exposure matrix, historical exposures (ever, never as reference) to mineral dusts, biological dusts, and gases or fumes were determined from self-reported occupations at baseline and during follow-up. Incident rate ratios (IRRs) of COPD were estimated for each exposure after adjustment for potential confounders. Gender, chronic bronchitis at baseline, and smoking status were evaluated for effect modification.
Results: Positive associations were observed between COPD and all occupational exposures but were not statistically significant ($p>0.05$). Relative to unexposed participants without chronic bronchitis, those with chronic bronchitis who were also exposed to either mineral dusts (IRR: 1.47, 95%CI: 1.00-2.15), biological dusts (IRR: 1.61, 95%CI: 1.12-2.31), or gases/fumes (IRR: 1.53, 95%CI: 1.10-2.12) had increased incidence of COPD. No considerable differences in IRRs were observed across sex and smoking status.
Conclusion: In Swiss working adults with pre-existing chronic bronchitis, occupational exposures to mineral and biological dusts, and gases/fumes increased the risk of incident COPD.

1904

Types and frequency of triggers experienced by asthma patients: A quantitative study

Peter Dale[1], Emma Elder[2], Gillian Newbold[3], Nicola Vyas[4], Sian O'Regan[5], David Price[6], Kenneth R. Chapman[7]. *[1]Global Health Outcomes, GlaxoSmithKline, Stockley Park, Uxbridge, United Kingdom; [2]Global Medicines Futures, R&D, GlaxoSmithKline, Stockley Park, Uxbridge, United Kingdom; [3]Research Director, HRW Healthcare, Wallington, Oxford, Oxfordshire, United Kingdom; [4]Research Director, HRW Healthcare, Wallington, Oxford, United Kingdom; [5]Senior Research Manager, HRW Healthcare, Wallington, Oxford, Oxfordshire, United Kingdom; [6]Academic Primary Care, University of Aberdeen, Aberdeen, United Kingdom; [7]University Health Network, University of Toronto, Toronto, ON, Canada*

Background: Detailed information about the frequency and type of asthma trigger exposures recognised by asthma patients is not readily available.
Methods: We used patient diaries and an online study to quantify triggers identified by patients with asthma in France, Germany, Italy, Spain and the UK. The study was completed by 1202 adults with asthma on maintenance therapy; 177 also completed an online diary every other day for 3 weeks.
Results: The majority of patients in the study were uncontrolled (76% had an Asthma Control Test score of ≤19). A wide variation in the number of triggers ever encountered by asthma patients was identified (1–36, mean 13); over one-third described having experiencing at least 16 triggers. Key triggers and the proportion of sufferers reporting ever experiencing them were: dust/dusting (72%), colds/influenza/sinusitis (69%), smoking (60%), smoke (59%), air pollution (58%), exercise (54%), strong odours (54%), weather changes (51%), mould (51%) and animals (50%). Dust/dusting was the most common and frequent trigger, whereas colds/influenza/sinusitis although common was experienced less frequently. Whilst many patients experienced a range of triggers, the combination of only 3 (dust/dusting, smoking and exercise) accounted for 79% of triggers experienced in the last 2–3 months. Diary entries showed 67% of asthma patients experienced at least one trigger on every day of diary completion. Only (7%) claimed to experience triggers infrequently (every 4–6 months or less often).
Conclusion: A wide range and high frequency of asthma triggers amongst asthma patients was identified. The most common were dust/dusting, colds/influenza/sinusitis, smoking and smoke.
Funded by GSK

1905

Role of occupational exposure on the outcome of sinus surgery: An observational study

Valerie Hox[1,2,3], Stefan Delrue[1], Hans Scheers[2], Els Adams[4], Stephan Keirsbilck[4], Mark Jorissen[1], Peter Hoet[2], Jeroen Vanoirbeek[2], Benoit Nemery[2], Peter Hellings[1,3]. *[1]Dept. of Otorhinolaryngology, Head and Neck Surgery, University Hospitals Leuven, Leuven, Belgium; [2]Research Unit of Lungtoxicology, KULeuven, Leuven, Belgium; [3]Lab. of Experimental Immunology, KULeuven, Leuven, Belgium; [4]Clinic for Occupational and Environmental Medicine, Dept. of Pneumology, University Hospitals Leuven, Leuven, Belgium*

Background: Functional endoscopic sinus surgery (FESS) is performed in patients with recurrent acute or chronic rhinosinusitis, insufficiently controlled by medical treatment. Several endogenous and exogenous factors may be responsible for failure of FESS with persisting symptoms. The association between occupational exposure and failure of FESS is not known.
Aim: The aim of this study was to evaluate the exposure to occupational agents in patients undergoing FESS and to relate the exposure to the number of FESS procedures needed to control symptoms.
Methods: Questionnaires were sent to 890 patients who had undergone one ore more FESS procedures and to 182 control subjects. Besides general medical health questions, the questionnaire asked about professional and recreational activities and exposure levels to high and low molecular weight (HMW and LMW) occupational agents. Exposure was assessed as a binary variable. A chi-square test was used to investigate the relationship between number of FESS and exposure state. Odds ratios were calculated by a Proportional Odds Model.
Results: Occupational exposure was reported in 11.6% of the controls (n=69) and in 24.6% of FESS patients (n=467). There is a significant relationship between increasing FESS and occupational exposure (chi=12.74, $p<0.001$). Exposed patients had a higher risk for needing at least 1 (OR=2.45, $p<0.05$) or at least 2 (OR=1.63, $p<0.05$) FESS procedures compared to unexposed ones. Mainly LMW agents were reported as occupational substances.
Conclusions: Exposure to occupational agents is associated with higher risk of failure after primary FESS, and hence underlines the importance of occupational exposure in the postoperative healing.

1906

Mothers work exposure during pregnancy and asthma in their children, a prospective cohort-study

Berit Hvass Christensen[1], Ann Dyreborg Larsen[2,4], Lars Rauff Skadhauge[3], Ane Marie Thulstrup[4], Karin Sørig Hougaard[2], Kirsten Skamstrup Hansen[5], Morten Frydenberg[6], Vivi Schlünssen[1]. *[1]Dept. of Environmental and Occupational Medicine, School of Public Health, Aarhus University, Aarhus, [2]National Research Center for the Working Environment, Copenhagen, [3]Dept. of Occupational Medicine, Hospital of South West Jutland, Esbjerg, [4]Dept. of Occupational Medicine, Aarhus University Hospital, Aarhus,[5]Dept. of Paediatrics JMC, University Hospital Gentofte, Gentofte, [6]Dept. of Biostatistics, School of Public Health, Aarhus University, Aarhus, Denmark*

Objectives: Prenatal exposures may add to the worldwide increase in asthma prevalence. We estimated the association between maternal work and the asthma prevalence among 7 year offspring.
Methods: Analysis included 45.658 children from the Danish National Birth Cohort and their mothers. Job title (DISCO codes) was classified by exposure agents: High molecular weight (HMW), low molecular weight/irritant (LMW), mixed exposures, farmers, unclassifiable exposures, students and reference (office workers). Children's asthma was defined as ever asthma and/or wheeze in the last 12 months. Atopy was defined as atopic dermatitis ever.
Results: The overall asthma prevalence was 16.1%. The highest asthma prevalence was among children, whose mothers were exposed to LMW/irritant agents during pregnancy (18.6%). Adj. logistic regression analysis showed an association between mother's occupational exposure to LMW/irritants and asthma in the child (OR 1.11 (95% CI 1.01-1.23)). The same tendency was seen for HMW (OR 1.12 (0.85-1.47)). Adjusted models included: Mothers age, BMI, atopy, smoking, use of medication, pets, SGA and gender. Stratifying for atopic status in the children did not change the results: OR 1.21 (0.75-1.96), OR 1.08 (0.77-1.50) for atopic and non-atopic children respectively in the HMW group, and OR 1.13 (0.94-1.35) and 1.13 (1.00-1.27) in the LMW/irritants group. No significant associations to asthma were seen in the other exposure groups.
Conclusion: The results indicate an association between maternal occupational work exposures and the risk of asthma in the child at age 7 years.

1907

Risk factors for decreased work ability among middle-aged men having asthma from youth

Irmeli Lindström[1], Antti Karjalainen[2], Ritva Luukkonen[3], Paula Pallasaho[1], Hille Suojalehto[1], Antti Lauerma[4]. *[1]Control of Hypersensitivity Team, [2]Team for Monitoring Working Conditions and Occupational Health, [3]Team for Statistical Services, Finnish Institute of Occupational Health, Helsinki, Finland; [4]Dept. of Dermatology and Venereology, University of Tampere, Tampere, Finland*

Background: Occupational exposure to irritants and dusts has shown to contribute to respiratory work disability (Toren et al Thorax 2009;64(4):339-44).

Aims: We studied the effect of asthma which begins in youth on work ability in men around the age of 40, and analysed the risk factors for asthma-related work disability.

Methods: Finnish Defence Force registers in 1986-1990 were used to select: 1. conscripts with asthma representing a mild asthma group (n=485), 2. asthmatics who were exempted from military service representing a moderate/severe asthma group (n=393) and 3. a control group (n=1500) without asthma. 54% of the men in the first asthma group, 44% of the men in the second asthma group and 44% of the controls answered the questionnaire in spring 2009. The coded occupational history was matched with the asthma-specific Job Exposure Matrix in order to evaluate occupational exposure to asthmogens and respiratory irritants. Logistic regression analyses were used when examining the associations between risk factors and decreased work ability.

Results: Self-assessed current work ability compared with lifetime best in scale 0-10 was decreased (<8) in 28.9% of the first asthma group, in 31.1% of the second asthma group, and in 19.7% of the controls (p=0.0007). Current smoking (OR 2.5), being a manual worker (OR 2.7), exposure to irritants (OR 1.7) and abnormal temperatures (OR 1.7) and current severe asthma (OR 3.8) associated with decreased work ability among the asthmatics.

Conclusions: The reduction of work ability in men having asthma from youth may be partly preventable, if young asthmatics are advised to avoid work involving exposure to the irritants or abnormal temperatures and smoking.

±