

Conclusions In summary, our study demonstrates that laboratory animal workers carry out animal allergen on their skin when they leave the animal facility at the end of the day. The implication of these findings will be considered in the development of safe working practices in prevention of laboratory animal allergy within the context of the SPIRAL study.

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TO DETERMINE MUS M 1 PERSONAL EXPOSURE IN LABORATORY ANIMAL WORKERS IN FACILITIES WHERE MICE ARE HOUSED IN OPEN CAGES AND INDIVIDUALLY VENTILATED CAGES

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Background Laboratory animal workers face the risk of developing an IgE-associated respiratory allergy to airborne proteins, such as Mus m 1 (mouse urinary protein). Approximately 15% of exposed employees will develop IgE sensitisation and 10% clinically apparent disease. We have recently embarked on a large study called SPIRAL (Safe Practice In Reduction of Allergy in Laboratories) to gain a greater understanding of laboratory animal allergy (LAA) and to determine whether we can devise a code of safe practice to prevent, as far as possible, the future occurrence of LAA.

Aim To determine personal exposure to Mus m 1 within animal facilities where mice are housed exclusively in open cages and exclusively in individually ventilated cages (IVC).

Methods Selected employees wore Casella Apex pumps (2 L/min) during their full shifts to collect inhalable particulate onto fluoropore membrane (1 µm), 25 mm filters using IOM sampling heads. 82 filters from an IVC facility and 56 filters from an open cage facility were analysed for Mus m 1 using a commercial sandwich enzyme linked immunoassay (Indoor Biotechnology).

Results The range of Mus m 1 levels within the IVC facility was 0.00–66.33 ng/m³ and in the open cage facility was 3.89–305.59 ng/m³. 11 (13%) of samples from the IVC facility and 50 (89%) of samples from the open cage facility had a Mus m 1 exposure level greater than 5 ng/m³. Additionally, there was substantial variation when task specific sampling was carried out over short periods of time compared with full shift sampling. Further analyses will allow us to identify which tasks were associated with highest levels of exposures.

Conclusions The majority of samples from the open cage facility were above 5 ng/m³, a figure previously suggested to limit or reduce incidence of LAA. Although use of IVCs has been shown to reduce exposure to Mus m 1, we found several samples above 5 ng/m³. Exposure to high allergen levels will be influenced by cage type, variation in individual working practices and carrying out of specific “high-risk” tasks; some of these factors may be modifiable and these results may be used to change practice.

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UPTAKE AND QUALITY OF HEALTH SURVEILLANCE FOR OCCUPATIONAL ASTHMA IN THE UK

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Introduction Statutory periodic health surveillance (HS) of workers can identify early cases of occupational asthma. Information about its uptake in the UK, and its content when carried out, are lacking.

Methods A telephone survey of employers, and their occupational health professionals, was carried out in three sectors with the potential for producing exposures, which may result in the development of occupational asthma (bakeries, wood working, motor vehicle repair).

Results 457 organisations participated (31% response rate); 77% employed less than 10 people, 17% between 10 and 50 and 6% more than 50. Risk assessments were common (67%) and 14% carried out any form of occupational asthma HS, rising to 19% if only organisations reporting asthma hazards and risks were considered. HS was carried out by both in-house (31%) and external providers (69%). Organisational policies were often used to define surveillance approaches (80%), but shared with the occupational health provider only in one third of cases.

Occupational health providers described considerable variation in practice, with differing approaches seen for information sharing and workplace visits. Record keeping was universal, but worker-held records were not reported. Health surveillance tools, such as a questionnaire, were generally developed in-house. Lung function was commonly measured, but only limited interpretation was evident. The referral of workers to local specialist respiratory services was variable.

Conclusions This study has provided new insights into the real world of health surveillance for occupational asthma in the UK. We consider that future work could and should define more practical, evidence based and simple approaches to HS, by working with the end users to develop interventions that meet their needs. This will ensure maximal uptake of high quality HS approaches and consistency.

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RESPIRATORY ILL HEALTH IN THE SILICA EXPOSED BRICK MANUFACTURING SECTOR

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Introduction Exposure at work to inhaled respirable crystalline silica (RCS) has previously been linked with silicosis, tuberculosis, lung cancer and COPD. Whilst the risk of developing silicosis is largely a function of cumulative lifetime RCS exposures, current workplace exposures contribute to this risk.

Methods A cross sectional GB based workplace study of brick manufacturers was carried out, in order to identify a subsequent longitudinal cohort. Participating worksites were using silica to make bricks for various uses. Consenting workers were asked to complete an interviewer led questionnaire, undergo lung function testing and complete a full occupational history including details of lifetime exposure to RCS. Consenting workers had a PA Chest Radiograph using a mobile facility, and levels of RCS exposure in the personal breathing zone were taken.

Results 189 workers took part, with a mean age of 45.9 years and 22 years median (range 0.08–47) years worked overall in industry. Three had radiological evidence of silicosis (ILO standards used; 2 definite and one probable case). Respiratory symptoms were common; for example 14.3% reported cough, 21.2% wheeze in the last 12 months, 14.3% reported ever having asthma. 13.2% reported at least one work related respiratory

symptom. Mean lung function values were as follows; mean (SD) percentage predicted FEV₁ 98.1 (15.2) and FVC 102.4 (13.9).

Fourteen workers had measured airways obstruction (as defined by an FEV₁/FVC <0.7); in this cross sectional analysis its presence did not significantly relate to current smoking status or lifetime duration of RCS exposure, although was significantly associated with an increased time worked in the current work area. Airways obstruction was also associated with the reporting of a diagnosis of (ever having) asthma and wheeze in the last 12 months.

Conclusions This cross sectional study of silica exposed brick workers has identified a cohort for longer term follow up. Future work will allow the development of dose response relationships, corrected for other relevant factors, between cumulative RCS exposure and FEV₁ decline and will assist in the development of workplace interventions to reduce the health risks associated with RCS exposure in this group of workers.

P62 A COMPARISON OF THE RELATIVE EFFECTS OF EXPOSURE ON FEV₁ AND FVC IN OCCUPATIONAL COPD

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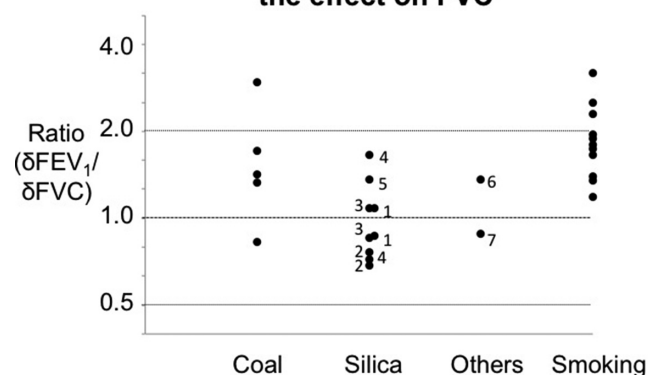
Introduction and objectives A wide range of occupational exposures to dusts and fumes are known to cause COPD. Little is known about the underlying pathophysiology as few studies have measured gas transfer or included CT scans. It is not known whether the relative degree of small airway disease and emphysema is similar to that seen with smoking or varies by causative agents. The modifying effect on lung function of pneumoconiosis, that is a feature of several accepted or possible causes of occupational COPD, is also uncertain.

Methods We have reviewed papers investigating exposure-response relationships for FEV₁ and FVC to a range of occupational dusts and fumes. We examined the ratio of the slopes of the regression equations relating exposure to FEV₁ and FVC for the occupational exposures and for cigarette smoking.

Results We identified 15 papers dealing with exposure to coal mine dust (5 papers), silica-containing dusts (8 papers) and other dusts (2 papers). The relative effects of exposure on FEV₁ and FVC are shown in Figure 1, together with the relative effects of smoking on FEV₁ and FVC obtained from the same papers. It should be noted that as FEV₁ is lower than FVC, an equal reduction in FEV₁ and FVC with exposure (ratio = 1) still leads to airflow obstruction. Cigarette smoking had an effect on FEV₁ that was approximately twice the effect on FVC. Coal mine dust was associated with a similar ratio of effect though with greater variability. Studies on silica-containing dusts had a more equal effect on FEV₁ and FVC. That was also the case for the two studies of non-silica containing dusts (carbon black and potash mining).

Conclusions COPD associated with exposure to silica-containing dusts appears to be associated with a more restrictive abnormality than COPD associated with cigarette smoking and coal dust, possibly because of a modifying effect of associated lung fibrosis.

Ratio of the effect of exposure on FEV₁ to the effect on FVC



Abstract P62 Figure 1 Key to exposures: 1 = gold mining, 2 = foundry work, 3 = talc processing, 4 = mixed exposures, 5 = silicon carbide processing, 6 = potash mining, 7 = carbon black mining

P63 IS DATA QUALITY MORE IMPORTANT THAN DATA QUANTITY IN THE DIAGNOSIS OF OCCUPATIONAL ASTHMA FROM SERIAL PEAK FLOW RECORDS?

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Background Serial measurements of peak expiratory flow (PEF) are a recommended method for confirming a diagnosis of occupational asthma and are the only available method for low molecular weight agents available to many non-specialists. There is a tradeoff between accepting only measurements fulfilling quality standards with reduced data quantity and accepting all measurements irrespective of quality. We have investigated the effect of systematically reducing quality or quantity on the diagnostic sensitivity and specificity of these records in the diagnosis of occupational asthma using the Oasys system.

Methods Serial PEF measurements from 36 specific inhalation challenge positive occupational asthmatics and 44 non-occupational asthmatics were used. Records contained 4 weeks of ≥ 4 PEF readings/day for 75% of days. PEFs were measured on metres without any data quality requirements. Data was corrupted in 2 ways: 1) Each PEF measurement was randomly changed to be up to +50 L/min or -50 L/min from the original value in increments of 10 L/min. Records were randomised 3 times and the sensitivity and specificity compared at each randomisation to the original using the Oasys score, area between curves (ABC) score and timepoint analysis. 2) Independently, the number of readings per day were reduced sequentially from ≥ 7 readings per day to 2 readings per day. The sensitivity and specificity of the Oasys score, area between curves (ABC) score and timepoint analysis were compared after each reduction.

Results Random alteration of individual readings had small effects on sensitivity and specificity at each randomisation (Table 1). When the number of readings were reduced, the sensitivity of the Oasys score and ABC score was extremely robust in all reductions down to 3 readings per day. The sensitivity of the