Characteristics of the Patients Diagnosed with Isocyanates-Induced Occupational Asthma (IIOA) between December 1990 and May 1999 in the Province of Quebec

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IIOA claims have increased in The Province of Quebec. IIOA natural history shows that bronchial hypersensitivity is an acquired phenomenon. Patients often remain with persistent symptoms even after withdrawal from isocyanates exposition. Symptom persistence depends on the duration of symptoms and the total exposition. Early withdrawal from isocyanates exposition after symptom appearance is an important prognostic factor. We retrospectively compared the severity of IIOA between the moment of diagnosis T_0 and 2 years later T_2. Cases are those diagnosed with IIOA by the Occupational Pulmonary Disease Board between December 1990 and May 1999 and referred to the CSST compensation program. A FEV_1 variation of ± 10% from T_0 to T_2 is considered significant. A non-specific bronchial hypersensitivity variation is significant if CP_{20} at T_2 is 3.2 times greater than CP_{20} at T_0. Bronchial hypersensitivity is normalized if CP_{20}>16 mg/ml at T_2. Clinical remission occurs when CP_{20}>16 mg/ml without anti-asthmatic medication. Data were analyzed using SPSS package. Of 49 IIOA cases (6 women; 43 men), 19 were non-smokers, 11 were current smokers and 19 former smokers. Anti-asthmatic medication use did not differ between T_0 and T_2 (P=0.37). FEV_1 significantly increased in 17%. Non-specific bronchial hypersensitivity improved in 14%. Bronchial hypersensitivity was normalized in 11%. Clinical remission occurred in 3% only. These results, as those already published, show the advantage to early detect IIOA and withdraw the worker from isocyanates exposition. IIOA program surveillance has already been recommended even in the absence of proofs. However, a current study in The Province of Quebec has the objective to assess the efficiency of such a program.

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Prognosis of Occupational Asthma Induced by Vinyl Sulphone Reactive Dyes after Avoidance

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Background and Aims: The outcome of reactive-dye induced occupational asthma (RD-OA) is not yet known. In this study, the recovery pattern in RD-OA patients after discontinuing RD exposure was analyzed.

Methods: All the enrolled patients (n=26) were diagnosed by bronchial provocation using causative RDs and had left their works. The mean follow-up duration was 7.2±3.3 years (range: 7 month~10.4 years) and the changes in their nonspecific airway hyperresponsiveness (AHR) and lung function were evaluated.

Results: The AHR had significantly improved and disappeared in 10 of 26 pts (38.5%) after having no exposure for 2.2±1.3 years. Among the 16 patients with AHR, 13 patients were further monitored at 8.5±2.1 years after avoidance. AHR was disappeared in an additional of 5 patients and improved in 4 patients. Another 3 patients could not take the methacholine test due to their severe asthma status. The prebronchodilator FEV_1 were not significantly improved at the time of the 1st visit. However, at the 2nd visit, the prebronchodilator FEV_1 was improved. The interval from the development of RD-OA symptoms to the diagnosis was significantly shorter in the AHR remitted group, but any differences in the incidence of a previous smoking history, latent periods, the total IgE concentration, and the presence of specific IgE to RDs was not found between remitted and non-remitted groups.

Conclusion: Early diagnosis associated with avoidance is the most important factors in determining the prognosis of RD-OA. Long term monitoring may be required in order to estimate extent of permanent impairment in RD-OA patients.

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Incidence of Asthma Attributable to Occupation among HMO Members

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To estimate the proportion of asthma caused by workplace exposures, we identified adult-onset asthma in a New England HMO population using searches of computerized billing and claims data for March 2000 though February 2002. Of 2117 potential cases, we confirmed 906 cases after detailed review of medical records. We were able to contact and interview by telephone 405 (44.7%) of the confirmed cases. The questionnaire was designed to categorize evidence of work-related asthma for each case based on our evaluation of their reported work-related symptoms and expert ratings of their workplace exposures. Combining cases with moderate and strong evidence (n=114) for work-related asthma and those with occupational RADS (n=2) to estimate the proportion of asthma attributable to occupational exposure resulted in an estimate that 28.6% (95% confidence 24.2 to 33.0%) of adult-onset asthma is work-related. This result is higher than the proportion estimated in our pilot study (21% 95% confidence 12-32%) but within the range of estimates compatible with that much smaller study.

Decision Matrix for Evidence of Work-Related Asthma

Expert Exposure Rating	Work Related Symptom Score			
	0	1	2	3
0	None (n=122)	Weak (44)	Weak (7)	Moderate (0)
1	Weak (79)	Moderate (61)	Moderate (11)	Strong (2)
2	Weak (37)	Moderate (31)	Strong (9)	Strong (2)

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Building-Related Asthma Is Due to Non-Allergic Mechanisms

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RATIONALE: In order to gain a better understanding of the pathogenesis of building-related asthma, this investigation explored indoor air quality measurements and clinical parameters of employees with new-onset asthma.

METHODS: Over several months, detailed environmental monitoring of a 2-story building and clinical investigations of employees were performed.

RESULTS: There was insufficient fresh air to dilute and remove indoor contaminants from the first floor. Recirculated air was reduced (65% of expected) and fresh air delivery was ~1/3 required (6.7 CFM/person); there were acceptable measurements on the second floor. First floor CO2 range was700 -1500 ppm; Second floor was less than 700 ppm. First floor formaldehyde (range, 170-570 ppm) was ~10-20 times higher than second floor levels (range, 18-60 ppm). Outdoor formaldehyde was 7 ppm. Outdoor Fungal levels (mean, 510 CFU/m3) were ~3 times higher than first floor (mean, 170 CFU/m3). A telephone survey (46 employees) identified 21 (46%) subjects with respiratory complaints; 19 worked on the first floor. Seven of 19 (37%) had new-onset, physician-diagnosed asthma. Spirometry, atopy, irritation and upper respiratory symptoms were similar for asthmatic and non-asthmatic subjects. Asthmatics were younger, had more family history of allergy, fewer mold skin allergy responses, and greater methacholine reactivity.

CONCLUSIONS: For this population, results suggest that building-related asthma developed through non-allergic mechanisms. Likely, reduced indoor fresh air supply allowed build-up of reactive molecules including formaldehyde. We propose that indoor chemical reactions may explain the outcomes of our investigation.

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The Prevalence and Risk Factors of Occupational Asthma among an Aircraft Industrial Development Company in Taiwan

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Objectives: To study the prevalence and risk factors of occupational asthma among aircraft workers, a cross-sectional survey was conducted in an aircraft industrial development company in Taiwan from March to November 2002. **Methods:** NIOSH occupational asthma questionnaire was used to collect the information of exposures and outcomes, including demographic information, previous work history, present work environmental information, previous medical history, and respiratory health. Multiple logistic regressions (SAS 8.2) were performed to assess the association between occupational asthma and risk factors, as well adjusting for potential confounders. **Results:** 1488 of the 1600 questionnaires (93%) were returned by the workers. 38 of the 1488 workers (2.6%) had probable asthma episodes and were diagnosed by physicians. 179 of the 1600 study subjects (12%) self-reported wheezing. After adjusting for potential confounders (age, gender, smoking, organic solvents, and work history), we found that weekly work hours, non-native-born Taiwanese, and welding was highly correlated with asthma. Welding workers had 7.3 times higher risk of reporting asthma than those of non-welding workers. **Conclusions:** Aircraft production workers self-reported wheezing episodes relatively commonly, with 2.6% of the study subjects reported having asthma and were diagnosed by physicians. We conclude that occupational asthma hazards do exist in the aircraft industrial environments, and recommend that welding workers be provided exhaust ventilation and respiratory protection to prevent the inhalation of particles or fumes during welding.

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Assessment of the Precision and Validity of Longitudinal Lung Function Data from Workplace Monitoring Programs

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We assess the precision and validity of longitudinal spirometry data obtained from workplace monitoring programs with the aim of identifying reliable data for epidemiologic research into the effect of occupational exposure on the development of chronic obstructive pulmonary disease (COPD). **Methods:** 17,878 workers from 23 assorted manufacturing plants participated in the monitoring programs from 1984 to 2002. Personnel conducting the screening were trained in the ATS guidelines. We assessed temporal changes in the precision of spirometric data over the calendar years 1984-2002 and over subject-specific testing periods (1 to 12) using the reliability coefficient G, which measures the relative size of the random error of measurement. Using the general linear mixed model, we analyzed the variation in two spirometry measurements repeated within 12 months of each other on a group of subjects and estimated within- and between-subject variation, from which we then calculated the coefficient G. In this way, we estimated G over follow-up testing periods and calendar years in each plant. To evaluate potential selection biases in the data, we compared the mean FEV_1% pred in workers who continued to participate with those who ceased to participate. **Results:** Across all plants, for the years 1984 to 2002, the respective coefficient G values for FEV_1 were: 0.94, no data, 0.92, 0.89, 0.87, 0.90, 0.91, 0.89, 0.88, 0.91, 0.92, 0.92, 0.92, 0.90, 0.91, 0.92, 0.89, 0.93. The above methods allow identification of plants and periods with relatively precise spirometry data and without apparent selective non-participation. **Conclusion:** The coefficient G and the validity analysis provided a practical tool for identifying relatively precise screening data for epidemiologic research. Monitoring of the coefficient G in workplace screening programs can assist in maintaining precise spirometry data.

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