

Incidence of occupational rhinoconjunctivitis and risk factors in animal-health apprentices

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Background: Exposure to laboratory animals often causes the appearance of immunologic sensitization and symptoms. **Objective:** Our aim was to determine the incidence of occupational rhinoconjunctivitis and the timing of symptoms and their determinants in apprentices starting exposure to laboratory animals.

Methods: Data from 387 (92.8%) of 417 students entering career programs in animal health in 5 schools were kept for analysis. Questionnaires and skin prick tests with common and occupational inhalants were carried out on entry and at follow-up visits scheduled at 8, 20, 32, and 44 months, depending on the schools. Responsiveness to inhaled methacholine was assessed at entry.

Results: Ninety-three (24%) subjects showed incident occupational rhinoconjunctivitis symptoms, and 37 (9.6%) had symptoms combined with skin sensitization to an animal-derived allergen. Symptoms such as sneezing, rhinorrhea, and itchy eyes tended to develop early in the course of exposure. In two thirds of the subjects, symptoms persisted at subsequent visits. In a multivariate analysis the determinants of the appearance of rhinoconjunctivitis with or without allergic sensitization included sensitization to grass pollens (odds ratio [OR], 1.78; 95% CI, 0.99-3.19), as well as nasal (rhinorrhea in contact with dust: OR, 1.79; 95% CI, 1.05-3.05) and bronchial symptoms (chest tightness: OR, 3.31; 95% CI, 0.98-11.25; cough on exposure to strong odors: OR, 1.88; 95% CI, 0.98-3.59).

Conclusion: The incidence of occupational rhinoconjunctivitis symptoms with or without immunologic sensitization is high in apprentices starting exposure to laboratory animals. Symptoms related to histamine release are common in the early course of exposure. Determinants include immunologic and target-organ susceptibility. (*J Allergy Clin Immunol* 2003;112:1105-11.)

Key words: IgE-mediated hypersensitivity, occupational exposure, occupational rhinoconjunctivitis, occupational asthma, asthma

Abbreviation used
OR: Odds ratio

Occupational rhinoconjunctivitis is a common condition in subjects exposed to high-molecular-weight agents.^{1,2} This condition is frequently associated with occupational asthma and seems to precede the latter condition in the case of high-molecular-weight allergens.³

The prevalence of occupational rhinoconjunctivitis in subjects exposed to laboratory animals is high. It has been estimated that the prevalence rate of allergy to laboratory animals is usually between 20% and 40%, with some 5% to 10% of exposed personnel having asthma.⁴ Atopy and intensity of exposure both contribute to the development of occupational rhinoconjunctivitis to laboratory animals.

Very few prospective studies have been carried out to determine the incidence and risk factors of occupational rhinoconjunctivitis to laboratory animals. In a cohort of 342 newly employed laboratory animal workers, Cullinan et al⁵ found an incidence of chest symptoms of 3.5 per 100 person-years and an incidence of eye or nose symptoms of 7.3 per 100 person-years. Degree of exposure was the most important determinant, but atopy increased the risk.

We initiated a cohort study of apprentices starting exposure to high-molecular-weight allergens.⁶ In the group of 417 students starting exposure to laboratory animals, we found that the incidence of skin sensitization to a laboratory animal was 7.9 per 100 person-years,⁷ whereas the incidence of probable occupational asthma was 2.7 per 100 person-years.⁸ In a study in which we examined the time course of sensitization and symptoms, we also showed that the incidence of occupational rhinoconjunctivitis was more than twice the incidence of occupational asthma at all time points, whereas the positive predictive value of occupational rhinoconjunctivitis for the development of occupational asthma was 11.4%.⁹ We also examined the occurrence of occupational rhinoconjunctivitis in workers exposed to flour. The incidence of rhinoconjunctivitis symptoms was high (16.1%), but the incidence of rhinoconjunctivitis symptoms coupled to immunologic sensitization was much lower (1.6%).¹⁰

The objectives of this study were to describe the time course of occurrence of occupational rhinoconjunctivitis

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TABLE I. Characteristics of subjects at entry into the cohort (n = 387)

Characteristics	
Age, mean $\pm$ SD	19.5 $\pm$ 2.9
Sex M/F, n (%)	55/332 (14/86)
Smoking, n (%)	49 (12.7)
Rhinitis, n (%)	
Nonspecific	165 (42.6)
On contact with pollen	90 (23.3)
On contact with pets	101 (26.1)
Atopy,* n (%)	153 (39.6)
Immediate skin reaction, n (%)	
To cat dander	49 (12.7)
To dog dander	39 (10.1)

*At least 2 skin test reactions to a ubiquitous allergen.

symptoms with or without immunologic sensitization and to identify the risk factors in the cohort of apprentices exposed to laboratory animals. In regard to the sequence of symptoms, we set the hypothesis that the first symptoms to occur will be those related to the release of mediators linked to immediate reactions, causing sneezing or runny nose or ocular itching,¹¹ whereas symptoms related to congestion might appear later. Concerning risk factors, we hypothesized that atopy, sensitization to pets, and the presence of nonspecific or allergic rhinitis before the beginning of occupational exposure might be relevant risk factors.

METHODS

A cohort of 417 students in animal-health technology was constituted by recruiting students from 5 institutions in Quebec, Canada; these students started in their programs between 1993 and 1995. The characteristics of the subjects, the exclusion criteria, and the methodology have been described elsewhere.⁶ In summary, students without significant previous contact to laboratory animals were evaluated at the beginning and at 8, 20, 32, and 44 months after the beginning of a professional course. A total of 387 subjects attended at least one of the follow-up visits and had complete data. Complete data at visit 2 were available for 345 (82.7%) of 417 and 355 (85.1%) of 417 subjects at the 20- and 32-month visits, respectively. The study was approved by the ethics committee of Sacré-Coeur Hospital, and the subjects provided written consent for their participation when recruited into this cohort study.

At entry into the study and at each follow-up visit, each student had to answer a respiratory questionnaire derived from a standardized questionnaire from the International Union against Tuberculosis and Lung Diseases.¹² Information about diagnosis of asthma and any allergic or familial status of asthma was collected. Symptoms suggesting asthma included wheezing, chest tightness, or dyspnea, as well as coughing without any specific provoking factor or associated with exercise or cold air, strong odor, smoke, or dust. Respiratory and rhinoconjunctivitis symptoms in relation to exposure to pets were also documented. Information about nasal symptoms (runny nose, stuffy nose, and sneezing), ocular symptoms (itchy eyes, watery eyes, and red eyes), respiratory symptoms (wheezing, cough, chest tightness, and dyspnea) and cutaneous symptoms during exposure to specific agents in the workplace was obtained at each visit. The animal-health program coordinator from each institution provided information on the number of hours spent in contact with rodents.

At each follow-up, skin prick tests were performed with 11 ubiquitous aeroallergens: mixed trees, mixed grass, and ragweed pollen; *Alternaria*, *Aspergillus*, and *Hormodendrum* species; feathers; *Dermatophagoides farinae* and *Dermatophagoides pteronyssinus*; and cat and dog dander (Omega, Montreal, Canada). Mite extracts and cat danders were standardized. All extracts were diluted and glycerinated to ensure the antigenic stability of the preparations. Histamine phosphate (1/200 g/mL) was used as a positive control, and the diluent (glycerine 50%) was used as a negative control. The largest wheal diameter was assessed 10 to 15 minutes after administering the antigen. A positive reaction was defined as a wheal of 3 mm or larger in the absence of reaction to diluent and a positive reaction to histamine phosphate. Atopy was defined as a positive reaction to at least 2 ubiquitous aeroallergens. Moreover, skin tests were also done with aeroallergens potentially present in laboratories frequented by students of animal technology. These were urinary protein of rats, mice, and rabbits (Pharmacia Allergon AB, Angelholm, Sweden) and dander of rabbits (Omega). The extracts were from the same batch and had been obtained in sufficient quantity to perform all the skin tests estimated necessary for the study to reduce possible sources of variability during follow-up. Skin tests were administered by the same nurse throughout the study period.

Inhalation tests to methacholine were also carried out by using doubling concentrations up to a maximum of 32 mg/mL to assess bronchial responsiveness.¹³ Bronchial reactivity was set at a PC₂₀ of 16 mg/mL or greater.¹⁴ The challenge tests were performed at the same time of the year (between September and April) in each institution.

Analysis of results

Incident occupational rhinoconjunctivitis was defined as the onset of symptoms of rhinoconjunctivitis and of specific sensitization to a work-related allergen during the follow-up period. The following symptoms were sought: sneezing, runny nose, nasal congestion, tears, itching of the eyes, and ocular redness. These symptoms had to be present at work and to improve during weekends, holidays, or both to be regarded as work related. The development of at least one of the first 3 symptoms was used to define rhinitis, and at least one of the last 3 symptoms was used to define conjunctivitis. At the time individual cases were identified as incidental cases of rhinoconjunctivitis, the nature of each rhinoconjunctivitis symptom detected simultaneously was documented. Moreover, we studied the time course of symptoms (transient or persistent and development of additional symptoms of conjunctivitis, rhinitis, or both) according to the period of occurrence and the nature of the first symptoms.

Statistical analysis

Univariate logistic regression analyses were carried out first, enabling us to identify risk factors (ie, sex, skin reactivity to animal-derived and pollen-derived aeroallergens, atopy, nonoccupational asthma, symptoms of allergic and nonallergic rhinitis, ocular symptoms in the presence of animals, respiratory symptoms suggestive of asthma, and bronchial responsiveness [≤ 16 vs > 16 mg/mL]) that were significantly associated with the incidence of rhinitis, conjunctivitis, and rhinoconjunctivitis, with or without specific sensitization to laboratory animals. The variables with a significant association ($P \leq .05$) were then included in separate multivariate logistic regression models to predict each of the different outcomes enumerated above. Statistical analysis was performed with SPSS software (version 10.0 for Windows; SPSS, Chicago, Ill).

RESULTS

The anthropometric, symptomologic, and functional characteristics are presented in Table I for 387 (92.8%) of

TABLE II. Incidence of work-related conjunctivitis, rhinitis, and rhinoconjunctivitis symptoms by incident-specific sensitization to laboratory animal–derived allergens

Symptoms	With or without specific sensitization		With specific sensitization	
	n	%	n	%
Conjunctivitis	78	20.2	33	8.5
Rhinitis	85	22.0	34	8.8
Rhinoconjunctivitis	93	24.0	37	9.6

TABLE III. Incidence of work-related rhinoconjunctivitis symptoms by time to follow-up after entry into the cohort and by incident-specific sensitization to laboratory animal–derived allergens

Time to follow-up (mo)	N	With or without specific sensitization		With specific sensitization		Without specific sensitization	
		n	%	n	%	n	%
0-8	378	42	11.1	15	4.0	27	7.1
8-20	358	36	10.1	16	4.5	20	5.6
20-32	214	15	7.0	6	2.8	9	4.2

TABLE IV. Frequency of initial symptoms of work-related rhinitis and conjunctivitis with or without incident-specific sensitization to laboratory animal–derived allergens

Symptoms	With or without specific sensitization		With specific sensitization		Without specific sensitization	
	n	%	n	%	n	%
Sneezing	57	61.3	27	73.0	30	53.6
Runny nose	54	58.1	26	70.3	18	32.1
Itchy eyes	52	55.9	29	78.4	23	41.1
Red eyes	33	35.5	21	56.8	12	21.4
Stuffy nose	26	28.0	19	51.4	7	12.5
Watery eyes	23	24.7	15	40.5	8	14.3

417 apprentices who entered the study. The study population comprised mostly young women. Approximately one quarter of this group of apprentices had already been afflicted with nonoccupational allergic rhinitis, and close to half reported at least one symptom of nonoccupational, nonspecific rhinitis.

Ninety-three subjects developed symptoms of work-related rhinoconjunctivitis; among these, 37 subjects also had sensitization to at least one workplace-related allergen (urinary proteins from rat, mouse, or rabbit and rabbit dander), thus meeting the criterion for occupational rhinoconjunctivitis (Table II).

We found that the incidence of symptoms of occupational work-related rhinoconjunctivitis with specific sensitization was similar at 8 and 20 months (4.0% and 4.5%, respectively) but tended to be lower (2.8%) at 32 months (Table III). As for symptoms of occupational work-related rhinoconjunctivitis without specific sensitization, the incidence tended to show a slight and constant decrease from the first period of follow-up to the end of the study.

The initial work-related rhinoconjunctivitis symptoms appeared alone or in association. The most frequent

were, in decreasing order, sneezing, runny nose, itchy eyes, ocular redness, nasal congestion, and watery eyes (Table IV). It is interesting to note that nasal congestion was the initial symptom for more than half of the subjects with incident occupational rhinoconjunctivitis compared with a proportion of only 12% among incident cases of rhinoconjunctivitis without sensitization.

Table V describes the time course of the symptoms that appeared most frequently as initial symptoms. Most often, the symptoms persisted or disappeared and then relapsed; however, a substantial proportion of subjects with rhinoconjunctivitis symptoms at the first follow-up period reported no symptoms at the end of follow-up. Among subjects who reported sneezing, runny nose, and itchy eyes as initial symptoms, 47.4%, 44.4%, and 59.6%, respectively, reported the incidence of a new symptom in addition to the initial one on a subsequent visit (Table VI).

Univariate logistic regression analyses were performed to estimate the association between the incidence of rhinoconjunctivitis symptoms at work and individual potential determinants present at the beginning of expo-

TABLE V. Time course of the 3 most frequent incident work-related symptoms

	Sneezing (n = 57)	Runny nose (n = 54)	Itchy eyes (n = 52)
Present at all follow-up visits, n	16	15	17
Relapse, n	3	3	1
Present at first follow-up visit with persistent remission, n	14	13	15
Present at first follow-up visit only,* n	24	23	19

*Includes subjects with only one follow-up visit.

TABLE VI. Frequency of occurrence of subsequent work-related symptoms in subjects whose first incident symptom was sneezing, runny nose, or itchy eyes

RC	Sneezing (n = 57)	Runny nose (n = 54)	Itchy eyes (n = 52)
No new symptoms, n	18	17	14
Sneezing, n	NA	7	6
Runny nose, n	3	NA	5
Stuffy nose, n	8	6	9
Itchy eyes, n	6	4	NA
Red eyes, n	6	5	5
Watery eyes, n	4	2	6
Not determined,* n	24	23	19

RC, Rhinoconjunctivitis.

*Subjects with only one follow-up visit.

TABLE VII. Association between incident work-related rhinoconjunctivitis with or without specific sensitization by host characteristics at entry into the cohort and exposure duration

Factor at baseline	Cases (RC) (n = 93) with factor, n (%)	Referents (n = 294) with factor, n (%)	OR	95% CI
Symptoms of conjunctivitis on contact with pets	55 (59.1)	79 (26.9)	1.88	1.16-3.10
Symptoms of rhinitis				
Sneezing on contact with pets	32 (34.4)	63 (21.4)	1.92	1.15-3.21
Runny or stuffy nose on contact with pollen	28 (30.1)	55 (18.7)	1.87	1.10-3.18
Sneezing on contact with pollen	27 (29.0)	54 (18.4)	1.82	1.06-3.11
Nonspecific rhinorrhea	52 (55.9)	104 (35.4)	2.32	1.44-3.72
Respiratory symptoms				
Chest tightness	9 (9.7)	8 (2.7)	3.83	1.43-10.24
Exercise induced	29 (31.2)	59 (20.1)	1.80	1.07-3.05
Cough on exposure to strong odors	24 (25.8)	42 (14.3)	2.09	1.18-3.68
Wheezing on exposure to strong odors	8 (8.6)	10 (3.4)	2.67	1.02-6.99
Immediate skin reaction				
Dog dander	16 (17.2)	23 (7.8)	2.44	1.23-4.85
<i>Dermatophagoides farinae</i>	43 (46.2)	94 (32.0)	1.83	1.14-2.94
Grass	34 (36.6)	53 (18.0)	2.62	1.56-4.39
Ragweed	34 (36.6)	62 (21.1)	2.16	1.30-3.58
PC ₂₀ (mg/mL)*				
≤16 vs >16	33 (35.5)	67 (22.8)	1.77	1.06-2.94
≤32 vs >32	43 (46.2)	91 (31.0)	1.81	1.12-2.93
Exposure to rodents (h)				
<16	17 (18.3)	97 (33.0)	1	—
16-52	35 (37.6)	125 (42.5)	1.60	0.8-3.1
≥52	32 (34.4)	54 (18.4)	3.38	1.6-7.0

ORs and 95% CIs were estimated by means of univariate logistic regression analyses.

RC, Rhinoconjunctivitis.

*Cases: n = 91; referents, n = 275 had a methacholine challenge test.

sure to laboratory animals. Table VII presents the odds ratios (ORs) for variables significantly associated with the incidence of rhinoconjunctivitis (95% CI not including the value 1.0). These were conjunctivitis on contact

with pets; symptoms of nonspecific and allergic rhinitis; respiratory symptoms, mostly caused by irritants; skin reactivity to dog, dust mites, and pollen; and bronchial reactivity. The time spent in contact with rodents was

TABLE VIII. Association between incident work-related rhinoconjunctivitis and specific sensitization by host characteristics at entry into the cohort

Factor	Cases (ORC) (n = 37) with factor, n (%)	Referents (n = 350) with factor, n (%)	OR	95% CI
Symptoms of conjunctivitis on contact with pets	19 (51.4)	98 (28.0)	2.71	1.37-5.39
Symptoms of rhinitis (runny nose)				
On contact with pets	14 (37.8)	81 (23.1)	2.02	1.00-4.11
Nonspecific	23 (62.2)	133 (38.0)	2.68	1.33-5.39
Immediate skin reaction				
Dog dander	9 (24.3)	30 (8.6)	3.42	1.48-7.91
Cat dander	12 (32.4)	37 (10.6)	4.06	1.88-8.75
Grass	14 (37.8)	73 (20.9)	2.31	1.13-4.71
Ragweed	16 (43.2)	80 (22.9)	2.57	1.28-5.16
Rat urine	4 (10.8)	10 (2.9)	4.12	1.23-13.87
PC ₂₀ (mg/mL)				
≤32 vs >32	21 (56.8)	113 (32.3)	2.89	1.42-5.91

ORs and 95% CIs were estimated by means of univariate regression analyses.
ORC, Occupational rhinoconjunctivitis.

associated with the incidence of rhinoconjunctivitis symptoms in a dose-response manner. In a multivariate logistic regression analysis including all variables presented in Table VII, the most satisfactory model included runny nose on contact with dust (OR, 1.79; 95% CI, 1.05-3.05), chest tightness (OR, 3.31; 95% CI, 0.98-11.25), respiratory symptoms on contact with strong odors or smoke (OR, 1.88; 95% CI, 0.98-3.59), and immediate skin reactivity to grass (OR, 1.78; 95% CI, 0.99-3.19; results not shown).

In a second series of univariate logistic regression analyses, we assessed the role of baseline host determinants on the incidence of occupational rhinoconjunctivitis. The results presented in Table VIII indicate that baseline symptoms of conjunctivitis on contact with pets and symptoms of nonspecific and allergic rhinitis were significant determinants, whereas baseline respiratory symptoms were not; immediate skin reactivity to rat urinary proteins at baseline was also a determinant for development of both symptoms of rhinitis at work and specific sensitization to a laboratory animal other than a rat. A greater proportion of subjects spending more than 52 hours in contact with rodents had occupational rhinoconjunctivitis (12/86 [13.95%]) compared with those exposed for less than 16 hours (7/114 [6.14%]); however, this was not significant. In a multivariate logistic regression analysis including the variables shown in Table VIII, immediate skin reactivity to cats (OR, 3.06; 95% CI, 1.31-7.14) and having a PC₂₀ of 32 mg/mL or less (OR, 2.33; 95% CI, 1.06-4.97) were the only 2 significant determinants of occupational rhinoconjunctivitis.

The incidence of probable occupational asthma, which was defined as the incidence of immediate skin reactivity to an occupational allergen and of bronchial hyperresponsiveness,⁸ was more frequent in the 37 subjects with occupational rhinoconjunctivitis (18/37 [48.7%]) than in the 56 subjects with rhinoconjunctivitis without specific sensitization (21.4% [12/56]).

DISCUSSION

Our study shows an incidence of 24% (93/387 subjects) for occupational rhinoconjunctivitis symptoms and 9.6% (37/387) for probable occupational rhinoconjunctivitis (ie, the combination of incident rhinoconjunctivitis symptoms and specific sensitization) in a cohort of apprentices starting exposure to laboratory animals. These figures are almost identical to the data published by Cullinan et al⁵ in a cohort of 342 newly employed laboratory workers. Indeed, these authors found an incidence of occupational rhinoconjunctivitis symptoms of 7.3 per 100 person-years, and of those subjects, 32% also had immunologic sensitization. However, the design of the study by Cullinan et al, although of a prospective nature, includes individuals who were first assessed up to 4 years after starting exposure; for them, the questionnaire was retrospective, recording the occurrence of symptoms that developed after starting their current employment.

Gordon and Newman-Taylor,⁴ in a review, quote prevalence figures of 20% to 40% for symptoms in workers exposed to laboratory animals. The high cumulative incidence of 24% for rhinoconjunctivitis symptoms found in our study after a relatively short follow-up period suggests that symptoms occur relatively rapidly after starting exposure. This is corroborated by earlier findings from the same cohort study showing that incidence figures of rhinoconjunctivitis symptoms tended to diminish in the third year of exposure (ie, 7.0% after 32 months of exposure compared with 11.1% after 8 months and 10.1% after 20 months).⁹ These findings suggest a short latency for the development of rhinoconjunctivitis symptoms. We can speculate that the most susceptible subjects (ie, 21.2%) already had rhinoconjunctivitis after the first 2 years of exposure.

We used 2 definitions to identify the incidence of work-related rhinoconjunctivitis, one with incident symptoms (with or without sensitization; rhinoconjunc-

tivitis symptoms) and one with incident symptoms associated with allergic sensitization (probable occupational rhinoconjunctivitis). As is common in epidemiologic studies and as reviewed by Siracusa et al,² there are many ways to define occupational rhinoconjunctivitis. The combination of symptoms and allergic sensitization obviously reinforces the plausibility of the condition, which can only be confirmed in a clinical situation by means of specific inhalation challenge tests.

It is interesting to note that, most often, the group of symptoms that appeared first was that of sneezing, runny nose, and ocular itching, all manifestations related to the development of an immediate immunologic reaction with histamine release.¹¹ Not only did the initial presentation of symptoms include one of these, but most often they were combined with others that also reflect histamine release. It is also interesting to find that two thirds of the time symptoms of occupational rhinoconjunctivitis persisted or increased in the subsequent visit, therefore suggesting a persistent immunologic reaction. The diminution or loss of symptoms in the remaining cases might be explained by fluctuations in the degree of exposure to specific occupational allergens during the training years.

Sixty percent (18/37) of students with symptoms of occupational rhinoconjunctivitis accompanied by immunologic sensitization are cases of probable occupational asthma, as described in a previous work.⁸ This association relates to the recent, much-discussed concept of "one airway one disease."¹⁵

In a preceding study carried out in the same cohort, the determinants identified for the development of probable occupational asthma, which was defined as the incidence of sensitization to an occupational allergen and of bronchial hyperresponsiveness, were sensitization to domestic animals and having measurable bronchial responsiveness (a provocative concentration of methacholine of ≤ 32 mg/mL at entry in the cohort before occupational exposure).⁸ It is interesting to note that these 2 factors are currently implicated in relation to the onset of an occupational rhinoconjunctivitis defined by the presence of symptoms and sensitization. Concerning the determinants of the appearance of rhinoconjunctivitis with or without allergic sensitization, the risk factors include an immunologic marker (ie, sensitization to grass pollens) as well as local susceptibility of the target organs (ie, nasal [rhinorrhea in contact with dust] and bronchial [chest tightness and cough in contact with strong odors] symptoms). In a study carried out in apprentices entering a pastry-making program, we found that having persistent rhinitis symptoms at entry was also a significant determinant for the incidence of work-related rhinoconjunctivitis symptoms (OR, 3.9).¹⁰ Although these apprentice studies have identified host determinants to be associated with new-onset work-related rhinoconjunctivitis, the predictive value of these factors for the incidence of rhinoconjunctivitis was low.⁹

Participation in the follow-up visits was satisfactory. Only 36 students dropped out of the program. The baseline atopic status was not a determinant for leaving the career

program; however, skin reactivity to laboratory animals at baseline (ie, pre-exposure) was more frequent in those leaving the program (25%) compared with the others (12%; $P = .02$), as reported in an earlier publication on the characteristics of quitters.¹⁶ Also, dropping out from the apprenticeship was not related to the incidence of work-related rhinoconjunctivitis or respiratory symptoms according to a telephone follow-up survey. We concluded that the attrition from the program was unlikely to have resulted in a substantial bias caused by a healthy worker effect.¹⁶

In conclusion, our study shows an incidence of occupational rhinoconjunctivitis and an association with allergic sensitization and occupational asthma, both of which were sufficiently increased to justify systematic surveillance in at-risk workers (ie, students and workers exposed to laboratory animals). It is known that occupational rhinoconjunctivitis symptoms can be managed with therapeutic interventions (antihistamines and anti-inflammatory preparations), which generally allow workers to remain at work.¹ However, because occupational rhinoconjunctivitis might predispose or concomitantly appear with occupational asthma, it is important to make sure that workers have no lower airway involvement. Surveillance programs designed to identify individuals with occupational rhinoconjunctivitis to detect occupational asthma at an early stage are relevant in this context.

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