

Occupational health aspects of latex allergy

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KEY-WORDS : Latex allergy – Occupational disease – Health care workers.

The first cases of natural rubber latex (NRL) allergy, reported in 1979-1980 in European countries [5, 12], appeared as work-related diseases in health care workers.

Later on, different studies revealed an increase of occupational allergic diseases due to latex, mainly in hospital personnel, and they also identified risk factors.

Such situations required efficient preventive measures and, at the individual level, need clear compensation procedures and policies for the reassignment of victims.

EPIDEMIOLOGY IN OCCUPATIONAL SETTINGS

The great majority of adult NRL allergies result from occupational exposure to latex gloves. The principal cross sectional studies of prevalence are listed on Table I. They are based on positive skin prick tests, and most concern health care workers in a hospital setting.

The rate of skin test positivity is much higher in these categories of workers than in the general population, where the prevalence is estimated to be less than 1 %.

During the last ten years, this prevalence increased from the first series reported from Finland [18] 2.8 % to the latest one reported from Canada [8, 16] 12.1 %.

This prevalence seems roughly related to the duration of exposure as shown by a German study on dental students [6], where it rises from 2 % in first year students to 10.4 % in last year students.

Nevertheless, only a portion of workers with positive skin-test are symptomatic. In the Hamilton, Ontario Hospitals latex study [9], 40 % of hospital workers with a positive latex skin test were clinically allergic to latex.

In the Vandenplas series [20], 2.5 % of health care workers in a Belgium hospital had occupational asthma induced by latex and confirmed by specific inhalation challenge.

These data can be compared with other sources such as the European intensive surveillance programs of occupational asthma that are based on reports from chest and occupational physicians : the SWORD surveillance scheme in the U.K. (Surveillance of Work related and Occupational Respiratory Diseases) and in France the ONAP program (Observatoire National des Asthmes Professionnels). The SWORD scheme, established in 1989, provides trends in occupational asthma incidence [13] : the percentage of latex-related occupational asthma among occupational asthma

Table I. – Prevalence studies of latex allergy in occupational settings

Author	Country	Year	Job categories	Prevalence of positive skin test (%)	Prevalence of other criteria (%)	Reference
<i>Health care workers</i>						
Turjanmaa	Finland	1987	Hospital health-care workers	2.8		[18]
			physicians	6.5		
			nurses	2.2		
			operating room physicians	7.4		
			operating room nurses	5.6		
Beaudoin	France	1989	medicine students	2.3		[3]
			Hospital workers	2.6		
			physicians	2.5		
Lagier	France	1992	nurses	3.5		[8]
			Operating room nurses	10		
Arellano	U.S.A.	1992	Physicians, surgeons anesthesiologists, radiologists	9.9		[2]
Berky	U.S.A.	1992	Dental surgeons		13,7 (questionnaire)	[4]
Heese	Germany	1995	Dental students			[6]
			first year	2		
Vandenplas	Belgium	1995	last year	10.4		[19]
					2,5 asthma (challenge test +)	
Liss	Canada	1997	Health care workers	12.1		[19]
<i>Others</i>						
Tarlo	Canada	1990	Glove manufacturing workers	11		[17]
Van der Walle	The Netherlands	1995	Hairdressers	9.7		[21]

cases increased from less than 1 % in 1989-1991 to 2% in 1995-1996 but the total number of reported cases (55 cases) is still far from that which can be extrapolated from the Vandenplas series. In the ONAP program, cases of latex asthma for 1996 make up 3.4 % of total cases (12 cases among 353) (1). This confirms the large discrepancy between the percentage of workers in surveys responding to skin tests and the small numbers of workers voluntarily reporting symptoms to occupational health schemes noted by Lagier in 1992 (8).

RISK FACTORS

Several authors insist on two main risk factors for the development of latex allergy : personal atopy and occupational exposure to irritants (for example, bleach, disinfectants) which can cause hand dermatitis and skin barrier disruption.

The concentration of atmospheric glove powder which acts as a vehicle for the allergens is considered by some to be a significant mode of respiratory sensitization for health care workers.

RECOGNIZING LATEX ALLERGIES AS OCCUPATIONAL DISEASES

Medico legal systems for recognizing occupational diseases greatly vary from one country to another. Even in European Union member states methods for reporting, recognizing and paying compensation are still far from uniform.

From a medical point of view, in 1994, scientific criteria for the diagnosis of occupational diseases were selected by an expert group of the European Commission for a list of recommendation published in 1990 concerning the adoption of a European schedule of occupational diseases. Latex was not identified as a specific item in this list but occupationally caused allergic contact dermatoses e.g. allergic contact eczema and allergic urticaria were.

In the specific notice, four criteria are required for the diagnosis of occupationally-caused allergic contact dermatosis :

- the sites of the lesions must be linked to contact with the product in question, even if in

some cases the area of the lesions is much larger than the area of contact,

- the case history must include an occupational exposure to a substance known to trigger dermatosis, a direct relationship between the development of the skin lesions and the work schedule, and a recurrence of the disease on re-exposure to the same agent,

- positive skin tests for the suspected substances, and

- a maximum latent period of a few days (the maximum latent period is the length of time from the last exposure to the point of time at which an exposed person has demonstrated the initial signs or symptoms).

Two other notices concern occupationally-caused asthma and occupationally-caused allergic rhinitis and conjunctivitis.

For asthma, the diagnostic criteria include :

- history : occupational exposure to a substance known to trigger occupational asthma ; the sequence of the attacks in direct relation to the work schedule, even if attacks begin several hours following exposure,

- recurrence of the disorder following re-exposure to the same agent,

- supportive evidence for certain allergens by

- * serial peak flow rate measurements,

- * rhinomanometric study with nasal provocation tests, and

- * IgE dependant immediate immune reactions (prick tests, raised levels of serum IgE specific to the occupational allergen).

A positive provocation test should not, however be required as a criteria for the recognition of occupational asthma due to the danger it may involve.

For rhinitis and conjunctivitis, the criteria are quite similar.

The French regulation for occupational diseases is based on official tables of the National Social Insurance Agency. When all the criteria of the table are fulfilled, the disease is considered as occupationally linked and the patient is entitled to compensative measures.

In May 1997, a specific table for latex-linked occupational diseases was added to the 94 previous tables (Table II).

If the criteria "maximum latent period" is not fulfilled, recognition as an occupational disease is still possible. In this case, the proof of the causal relation between the exposure to latex and the disease must be brought by the victim, and the dossier is submitted to a specialized medical committee.

Table II. – Occupational allergic diseases caused by natural rubber latex proteins

<i>Diseases</i>	<i>Maximum latent period</i>	<i>Main jobs involved</i>
Contact urticaria recurrent after re-exposure and confirmed by a test	7 days	Preparation, use and handling of natural Latex and products containing natural latex
Rhinitis, asthma, acute and bilateral conjunctivitis recurrent after re-exposure and confirmed by a test	7 days	Notably : * production and treatment of natural latex * manufacturing and handling items in natural latex
Systemic allergic reactions such as : giant urticaria, Quincke edema, anaphylactic shock linked with exposure to latex	3 days	
Eczematiform lesions recurrent after re-exposure or confirmed by a positive patch test	15 days	

REASSIGNMENT OF HEALTH CARE WORKERS WITH NRL ALLERGY

For a highly specialized health care worker with symptomatic latex allergy, reassignment at work depends on several factors related to the severity of the disease and to the policy of the hospital for prevention of latex induced diseases. This requires a case-by-case evaluation by the occupational physician and it is based on :

- the nature of symptoms : skin or respiratory allergy,

- the severity of the disease,

- the recommendation of all the physicians in charge of the person with NRL allergy,

- an analysis of prescribed tasks,

- the possibility of alternative hand protection, and

- the quality of the work environment (mechanical ventilation...).

Published studies on professional consequences of allergic diseases due to latex are lacking but from field experience, occupational physicians in hospital settings have identified two extreme situations :

- the case of the health care worker with very limited skin symptoms for whom early substitution of gloves and careful medical surveillance allow the person to be maintained in the previous job,

- the case of operating room personnel with severe attacks of asthma due to airborne latex who must absolutely avoid hospital sites where starch powdered latex gloves are used.

PREVENTIVE MEASURES IN OCCUPATIONAL SETTINGS

The general strategy for prevention of occupational risks is based mainly on :

- substitutive procedures for hazardous substances,
- limitation of occupational exposure, and
- medical surveillance of exposed workers.

If we focus on the third point – as the first two will be discussed elsewhere in this review – the medical surveillance of exposed workers consists of a pre-employment examination and periodic visits to the occupational Health Service. These medical examinations will detect personal risk factors for latex allergy.

On the pre-employment visit, special attention will be paid to the atopic status of the candidate and to his medical history. If a previous NRL

allergy or a food allergy to cereals, banana or other fruits is detected, the fitness for a latex-exposed work is highly questionable. If a common allergy usual – or even atopic asthma – is detected, individual reinforced medical surveillance can be proposed.

Routine serologic screening for latex allergy is not recommended, as its clinical relevance has not yet been evaluated.

At the individual level the occupational physician provides specific information on latex allergy : sources and routes of allergens, risk factors, first symptoms, alternative hand protection, etc.

On periodic visits workers must be systematically asked about early symptoms of latex allergy, and the medical examination must focus on the detection of clinical signs of NRL allergy and on detection of hand dermatitis from detergents or disinfectants, a well known risk factor for latex sensitization.

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