

Latex allergy in Bozyaka Social Security Hospital workers, Turkey

Kose Sukran and Mandiracloglu Aliye

R | A

Keywords: latex allergy · healthcare personnel

Latex glove used in healthcare settings has risen dramatically since around 1987. The increased threat of contracting HIV, hepatitis B, and other infectious agents during the course of delivering health care to patients has created the need for barrier protection.¹ Studies have estimated that the prevalence of latex allergy in healthcare workers ranged from 2.9% up to 17%.²

The purpose of the study was to evaluate reactions to latex gloves amongst hospital staff and to investigate the association between natural rubber latex (NRL) allergy and the staff's characteristics.

METHODS

This cross-sectional study was carried out at a 750-bed general hospital (Bozyaka Social Security Hospital) in Izmir during 1998. A representative sample size of 207 was calculated by Epi Info 5.0 (from a total of 980 hospital personnel). The subjects were randomly sampled from the list of hospital staff within all departments of the hospital. Subjects were excluded if they refused to participate in the survey or were pregnant. The study population completed a questionnaire that was administered by a general practitioner during an interview. Of these staff members, 120 (59%) underwent prick tests with latex extract. Questions included: the type of glove used, the number of gloves changed and the total hours per day that gloves were worn. The self-reported presence of allergy symptoms, demographic data, family and previous history of allergies were also determined. Skin testing was performed on 120 volunteers from the 207 subjects by an immunologist. Commercial latex extract (100 IR/ml, Laboratories Stallergenes Paris, France) was used for skin prick tests (SPT). Temoin (2069, Stallergenes SA-France) was used for negative control and histamine hydrochloride 10 mg/ml as a positive control. Skin testing was read 15 minutes after application. The skin prick test was considered positive if the main diameter of the wheal was at least 3 mm larger than the negative control.

Data was analysed using the statistical software SPSS version 10.0. A chi-square test was performed. Significance was accepted at $P < 0.05$. Logistic regression analysis was applied to evaluate the influence of potential risk factors by allergic symptoms.

The odds ratio estimates were given with their corresponding 95% confidence intervals.

RESULTS

Seventy of the subjects were men. The mean age was (32.05 ± 8.1) years. The mean length of employment in the medical field was (9.34 ± 7.0) years. The vast majority of subjects work full-time while the remainder work part-time (86.8% and 13.2%, respectively). The mean number of hours of latex exposure each day at work was 1.8 ± 2.3 (5 minutes – 10 hours). Department allocation included: almost half (48%) belonged to surgical; nearly one-fifth (18%) medical; one-quarter (24%) laboratory and one-tenth (11%) haemodialysis. Self-reported allergy histories were described as follows: drug allergy (9.3%), food allergy (7.9%), pollen allergy (22.9%), dust allergy (27.7%), detergents allergy (18.0%), and glove allergy (2.5%).

Logistic regression analysis was applied to evaluate the influence of potential risk factors by allergic symptoms. The independent variables used were age, gender, the presence of allergy history, family history, length of employment and the number of times that gloves were used per day (neither asthma nor conjunctivitis were used as independent variables). Allergy history (drug, food, pollen, dust, detergent) was significantly associated with urticaria, itching without redness, hay fever, and night

Ege University Faculty of Medicine, Department of Public Health, Izmir; Bozyaka Social Security Hospital, Department of Immunology, Izmir, Turkey (Kose S and Mandiracloglu A)
Correspondence to: Asst. Prof. Dr. Aliye Mandiracloglu, Ege Universitesi, Tip Halk Sagligi Bornova 35100, Izmir, Turkey (Email: mandirac@med.ege.edu.tr)

cough risk. By means of logistic regression, a significant positive association was found between the risk of eczema and age [odds ratio 3.03, 95% CI (1.01-9.11)]. Eczema prevalence was higher in the third decade of age.

Of the 120 subjects who underwent the skin test, two-fifths (41.7%) tested positive to latex products. There was not a significant difference between volunteers and other subjects according to latex exposure, personal or family allergy history and presence of the allergic symptoms. Three-quarters (75%) of test positive subjects reported regular use of latex gloves. Breakdown, by department, of latex test positive cases is as follows: nearly two-fifths of subjects in both the lab and surgical units (44% and 42%, respectively) and less than one-tenth of subjects in both the medical and haemodialysis units (6% and 6%, respectively).

There was a significant relationship between the number of gloves used daily and the negative skin prick test ($\chi^2 = 8.170$, $P = 0.017$). The health workers had a history of multiple glove changes per day from 2 – 50. The percentage of latex allergy was found lower among persons who changed their gloves often. There was a significant association between the length of daily glove use and the frequency of daily glove changing ($\chi^2 = 13.50$, $P = 0.03$). The duration of wearing gloves was higher in persons who changed gloves 1 – 5 times per day. There was no association between the latex skin test and allergy history. The history of allergic rhinitis was higher in the SPT-positive group ($\chi^2 = 4.290$, $P = 0.035$) (Table).

DISCUSSION

Fifty individuals in the study had latex positive prick skin tests. Latex SPTs was positive in 10/206 healthcare workers (9.22%) in another Turkish study.³ This difference may be related to the brand of gloves and frequency and duration of glove wearing. Old habits, using powdered gloves, continued among hospital workers. The skin prick test was carried out among volunteers who might have had higher allergic symptoms. Results from analyses comparing volunteers to others found no differences between the two groups.

In this study, there was a significantly higher prevalence of latex test positive results in hospital personnel who used the same gloves a long time.

Six office staffs also had latex exposure and positive prick test to latex. In Finland, 1 out of 130 (0.8%) non-healthcare workers at a university hospital were rubber allergic according to the prick test and antigenic

Table. Comparison of characteristics in latex negative and positive subjects (n = 120)

Characteristics	Latex negative (n = 70) %	Latex positive (n = 50) %
Duration of employment (year)		
< 1	12.9	10.0
1 – 5	24.3	32.0
6 – 9	15.7	14.0
> 10	47.1	44.0
Age (year)		
20 – 29	38.6	34.0
30 – 39	38.6	44.0
> 40	22.9	22.0
Daily glove use (hour)		
< 1	66.0	61.9
1 – 3	10.0	16.7
3 – 5	16.0	14.3
> 5	8.0	7.1
No. of times gloves changed (per day) *		
1 – 5	45.6	73.7
6 – 9	14.0	2.6
> 10	40.4	23.7
Latex exposure presence	87.1	94.0
Allergy history presence	57.4	42.6
Family history	37.1	42.0
Symptoms		
None	11.4	6.0
Asthma	7.1	4.0
Night cough	4.3	10.0
Urticaria	15.7	22.0
Hay fever or rhinitis *	10.0	24.0
Eye symptom	34.3	26.0
Itching without urticaria	35.7	26.0
Eczema	11.4	20.0
Occupation		
Physician	44.4	55.6
Nurse	61.4	38.6
Laboratory technicians	66.7	33.3
Office staff	85.7	14.3
Paramedic	61.1	38.9

* Significant difference between latex negative and positive groups.

challenge.⁴ Of the 56 “allergy history positive” subjects felt their symptoms were caused by latex. Interestingly, less than one-tenth (6.0%) of the positive subjects were asymptomatic. Some of the health workers were not aware of the risk of latex allergy in themselves. Only 2.5% of them reported glove allergy. The finding of history-negative, skin prick test-positive latex healthcare workers has been noted previously.^{2,5}

CONCLUSION

Latex-allergic workers should use only non-latex gloves and avoid all latex-containing products and, as further prevention, these workers should avoid unnecessary use

of latex gloves if they are the only source available.

More education on occupational risks and means of protection should be given to healthcare workers as well as information on the signs and symptoms of latex sensitive reactions and treatments.

REFERENCES

1. Hunt LW, Boone-Orke JL, Fransway AF, et al. A medical-center-wide, multidisciplinary approach to the problem of natural rubber latex allergy. *J Occup Environ Med* 1996;38: 765-770.
2. Mace SR, Sussman GL, Liss G, et al. Latex allergy in operating room nurses. *Ann Allergy Asthma Immunol* 1998; 80:252-256.
3. Sener O, Taskapan O, Ozangic N. Latex allergy among operating room personnel in Turkey. *J Invest Allergol Clin Immunol* 2000;10:130-135.
4. Vandenplas O, Delwiche J, Evrard C, et al. Prevalence of occupational asthma due to latex among hospital personnel. *Am J Respir Crit Care Med* 1995;151:54-60.
5. Arellano R, Bradley J, Sussman G. Prevalence of latex sensitization among hospital physicians occupationally exposed to latex gloves. *Anesthesiology* 1992;77:905-908.

(Received June 13, 2002)

本文编辑: 刘 晖