

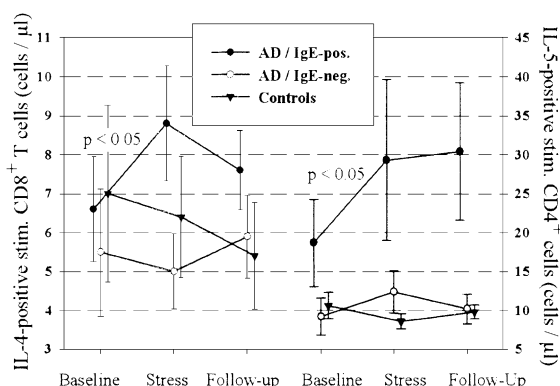


FIG 1. Time course of IL-4⁺ CD8⁺ T lymphocytes and IL-5⁺ CD4⁺ T lymphocytes in the peripheral blood 1 hour before (*Baseline*), immediately after (*Stress*), and 1 hour after stress exposure (*Follow-Up*) in healthy controls, AD patients with low serum IgE baseline levels (*AD/IgE-neg.*), and AD patients with high serum IgE baseline levels (*AD/IgE-pos.*). Significant contrasts between *Baseline* and *Stress* or between *Stress* and *Follow-Up* are indicated by *P* values.

($P_{tB-S} < .01$). In this group, 1 $\times$ 3 ANOVA revealed a significant effect over the 3 measurements ($P_{tBaseline-Stress-Follow-Up} < .05$).

Surprisingly, our results show that only IgE^{high} seem to respond to psychosocial stress with an activation of functionally important immunological parameters, indicating an altered stress responsiveness, compared with IgE^{low} and HC. Increases in IL-4- and IL-5-secreting T_H2-type cells and decreases in IFN- γ -secreting T_H1-type cells are typical blood abnormalities noted in patients with AD,⁵ indicating a shift in the T_H1/T_H2 balance toward T_H2-like memory cells producing IL-4 and IL-5. Even the increased IgE responses observed in AD reflect an increased expression of T_H2 cytokines.⁶ Furthermore, a significant inverse correlation has been reported between IFN- γ generation *in vitro* and IgE serum concentrations *in vivo* in AD.⁷ It is interesting to note that we found increases of IL-4 in PBMCs and high baseline levels of IL-4 in IgE^{high} in contrast to HC and IgE^{low}; this supports the findings that T_H2 cells produce IgE synthesis promoting IL-4.⁸ Furthermore, we found increases of T lymphocytes with intracellular IL-5 immediately after the stress exposure only in IgE^{high}. This increase of IL-5 correlates with increases of CLA⁺ T-cell levels after stress. CLA⁺ is a very important cell adhesion molecule that participates with its counterreceptor E-selectin (CD62E) in skin-selective T-cell homing.⁵ Isolated CLA⁺ T cells from patients with AD, but not healthy subjects, showed a spontaneous production of IL-4, but not IFN- γ .⁵ In addition, recent studies have demonstrated that CLA⁺ T cells in AD spontaneously secrete IL-5 and IL-13, functionally prolong eosinophil survival, and induce IgE synthesis.⁹

In summary, these findings provide the first evidence of different stress responsiveness of patients with AD depending on serum IgE baseline levels. High serum IgE baseline levels are associated with higher increases of

CLA⁺ CD8⁺ T lymphocytes and of T cells expressing T_H2 cytokines upon psychological stress.

Michael Stephan, MD^a

Burkard Jaeger, PhD^a

Friedhelm Lamprecht, MD^a

Alexander Kapp, MD^b

Thomas Werfel, MD^b

Gerhard Schmid-Ott, MD^a

^aDepartment of Psychosomatic Medicine

Hannover Medical School

Carl-Neuberg-Straße 1

30625 Hannover

Germany

E-mail: Schmid-Ott.Gerhard@mh-hannover.de

^bDepartment of Dermatology and Allergology

Hannover Medical School

REFERENCES

- Novak N, Bieber T. Allergic and nonallergic forms of atopic diseases. *J Allergy Clin Immunol* 2003;112:252-62.
- Leung DY, Bieber T. Atopic dermatitis. *Lancet* 2003;361:151-60.
- Schmid-Ott G, Jaeger B, Meyer S, Stephan E, Kapp A, Werfel T. Different expression of cytokine and membrane molecules by circulating lymphocytes on acute mental stress in patients with atopic dermatitis in comparison with healthy controls. *J Allergy Clin Immunol* 2001;108:455-62.
- Schmid-Ott G, Jaeger B, Adamek C, Koch H, Lamprecht F, Kapp A, et al. Levels of circulating CD8(+) T lymphocytes, natural killer cells, and eosinophils increase upon acute psychosocial stress in patients with atopic dermatitis. *J Allergy Clin Immunol* 2001;107:171-7.
- Leung DY, Soter NA. Cellular and immunologic mechanisms in atopic dermatitis. *J Am Acad Dermatol* 2001;44:S1-12.
- Leung DY. Atopic dermatitis: the skin as a window into the pathogenesis of chronic allergic diseases. *J Allergy Clin Immunol* 1995;96:302-18; quiz 19.
- Reinhold U, Pawelec G, Wehrmann W, Herold M, Wernet P, Kreysel HW. Immunoglobulin E and immunoglobulin G subclass distribution in vivo and relationship to in vitro generation of interferon-gamma and neopterin in patients with severe atopic dermatitis. *Int Arch Allergy Appl Immunol* 1988;87:120-6.
- Pene J, Rousset F, Briere F, Chretien I, Bonnefoy JY, Spits H, et al. IgE production by normal human lymphocytes is induced by interleukin 4 and suppressed by interferons gamma and alpha and prostaglandin E2. *Proc Natl Acad Sci U S A* 1988;85:6880-4.
- Akdis M, Akdis CA, Weigl L, Disch R, Blaser K. Skin-homing, CLA⁺ memory T cells are activated in atopic dermatitis and regulate IgE by an IL-13-dominated cytokine pattern: IgG4 counter-regulation by CLA⁺ memory T cells. *J Immunol* 1997;159:4611-9.

Available online August 9, 2004.

doi:10.1016/j.jaci.2004.06.041

Latex aeroallergen concentrations in ambulances

To the Editor:

Natural rubber latex (NRL) has emerged as a significant sensitizer contributing to respiratory allergy, particularly among health-care workers.¹ Absorbable dusting powder aerosols that carry NRL allergenic proteins become airborne when powdered latex gloves are used.²⁻⁴ The concentration of NRL aeroallergen in a 7-m³ challenge chamber that induced an asthmatic reaction in a group of health-care workers with NRL-induced asthma ranged

between 199 and 1107 ng/m³.⁵ The cumulative inhaled NRL dose for asthmagogenesis among these subjects ranged between 25 and 515 ng, with exposure durations of 3 to 114 minutes.⁵

This study is the first to quantify NRL bioaerosol concentrations in ambulances (model Citroën Jumper). Latex aeroallergens were captured with an area air sampler (AAS) (Quan-Tec-Air, Inc, Rochester, Minn) operated for 1 hour at a flow rate of 2.5 L/s and personal breathing zone (PBZ) air-sampling pumps (SKC Inc, Eighty Four, Pa) at a flow rate of 3 L/min. Airborne particles were collected onto polytetrafluoroethylene 0.3-μm filters rated 99.9% efficient. The filters were extracted in 0.1 mol/L phosphate buffer and assayed immunochemically.³ PBZ air-sampling pumps were worn by paramedics during their work shift and were operated only inside the ambulance confinement (approximately 9 m³) for 5 to 6 hours. The NRL aeroallergens were quantified (ng/m³) as a time-weighted average by a competitive IgE immunoassay by using sera from latex-sensitive individuals.³ The limit of detection was approximately 1 ng/m³ for AAS and 5 ng/m³ for PBZ air samplers. Differences in allergen detection limits are related to collection volumes.

A brand-new, so-called latex-free, ambulance was developed by the Emergency Health System (Servicio de Urgencias Médicas de Madrid) from Madrid (Spain) to attend patients allergic to NRL. All structural materials and medical equipment used in this ambulance were latex free, as certified by the suppliers. Only synthetic gloves were used in this ambulance.

The NRL aeroallergen concentration in the so-called latex-free ambulance was undetectable with the AAS. In an ordinary ambulance that had been in use for several years, the NRL aeroallergen concentration after a 24-hour shift of continuous activity (with intense use of powdered NRL gloves) was 4364 ng/m³. The NRL aeroallergen concentration measured over a 24-hour period in the ambulance headquarters coordination office, a large room of approximately 100 m² where NRL gloves were very seldom used, was 1 ng/m³. With PBZ sampling pumps, the concentrations of NRL aeroallergen in 4 ordinary ambulances during their regular work activities were 159, 23, 107, and 30 ng/m³.

These results show that ordinary ambulances in which powdered NRL gloves are used show moderate (10-50 ng/m³), high (>50 ng/m³), or even very high latex aeroallergen concentrations. A latex-free ambulance can be developed by avoiding all latex equipment, which provides a safe environment for both health-care workers and patients who are allergic to NRL. Notwithstanding, because powdered NRL gloves are the major contributor to airborne latex,³⁻⁶ by using powder-free NRL gloves and thoroughly cleaning vehicle surfaces likely to serve as allergen repositories, the latex aeroallergen concentration can be decreased to acceptable levels.^{4,7,8} Strict avoidance of direct contact with all NRL objects should be still applied for subjects who are allergic to NRL.

Santiago Quirce, MD, PhD^a

Carmelo Escudero, MD^a

Mark C. Swanson, BA^b

María José Martínez-Aramayona, MD^c

Mar Fernández-Nieto, MD^a

Joaquín Sastre, MD, PhD^a

^aAllergy Department

Fundación Jiménez Díaz

Madrid, Spain

^bAllergic Diseases Research Laboratory

Mayo Clinic and Foundation

Rochester, Minn

^cPreventive Medicine Department

Hospital de la Princesa

Madrid, Spain

REFERENCES

1. Vandenplas O, Delwiche JP, Evrard G, Aimont P, van der Brempt X, Jamart J, et al. Prevalence of occupational asthma due to latex among hospital personnel. *Am J Respir Crit Care Med* 1995;151:54-60.
2. Heilman DK, Jones RT, Swanson MC, Yunginger JW. A prospective controlled study showing that rubber gloves are the major contributor to latex aeroallergen levels in the operating room. *J Allergy Clin Immunol* 1996;98:325-30.
3. Swanson MC, Bubak ME, Hunt LW, Yunginger JW, Warner MA, Reed CE. Quantification of occupational latex aeroallergens in a medical center. *J Allergy Clin Immunol* 1994;94:445-51.
4. Tarlo SM, Sussman G, Contala A, Swanson MC. Control of airborne latex by use of powder-free latex gloves. *J Allergy Clin Immunol* 1994;93:985-9.
5. Quirce S, Swanson MC, Fernandez-Nieto M, de las Heras M, Cuesta J, Sastre J. Quantified environmental challenge with absorbable dusting powder aerosol from natural rubber latex gloves. *J Allergy Clin Immunol* 2003;111:788-94.
6. Heilman DK, Jones RT, Swanson MC, Yunginger JW. A prospective, controlled study showing that rubber gloves are the major contributor to latex aeroallergen levels in operating room. *J Allergy Clin Immunol* 1996;98:325-30.
7. Allmers H, Brehler R, Chen Z, Raul-Heimsoth M, Fels H, Baur X. Reduction of latex aeroallergens and latex-specific IgE antibodies in sensitized workers after removal of powdered natural rubber latex gloves in a hospital. *J Allergy Clin Immunol* 1998;102:841-6.
8. Charous BL, Schuenemann PJ, Swanson MC. Passive dispersion of latex aeroallergen in a healthcare facility. *Ann Allergy Asthma Immunol* 2000;85:285-90.

doi:10.1016/j.jaci.2004.07.011

Anaphylaxis to mizolastine

To the Editor:

Modern antihistamines are essential in the treatment of type I allergic diseases.¹ Mizolastine (Mizollen; Sanofi-Synthelabo GmbH, Berlin, Germany; Zolim, Schwarz Pharma GmbH, Monheim, Germany) is a peripherally acting selective H₁-receptor antagonist used worldwide for the symptomatic relief of seasonal allergic rhinoconjunctivitis (hay fever), perennial allergic rhinoconjunctivitis, and urticaria. Its efficacy and tolerance in humans have been demonstrated in many studies.²⁻⁴ H₁-antihistamines generally have the potential to produce a wide variety of short-term and long-term adverse effects.⁵ The most common side effects reported for the second-generation H₁-antagonist mizolastine are drowsiness and fatigue.^{2,4} Other adverse effects listed in the "Summary of