

our study the compliance of asthmatic patients issued plastic mattress covers was high—namely, 87%, 91%, and 86% at 4, 8 and 12 months, respectively. These compliance rates are similar to those in the present study, but were maintained by a considerably larger group of patients for a much longer time. Our patients who continued to sleep on plastic covers found them comfortable and were happy to use them. Furthermore, our patients were adults who presumably could have expressed intolerance to their bedding materials, whereas 5 of 8 patients in Owen and colleagues' study were children. Owen et al claim that their experimental material is comfortable, yet we note that 1 patient (of 8) was unable to tolerate its use after only six weeks. They provide no evidence that their new material confers any benefit over plastic mattress covers.

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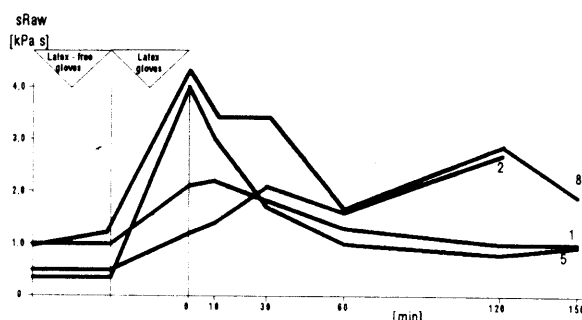
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Airborne antigens from latex gloves

SIR,—Articles made of natural rubber (latex) are used increasingly in medicine and for housework for example. Hypersensitivity reactions to latex¹⁻⁸ include eczema, contact urticaria, respiratory symptoms, and shock. The respiratory symptoms and shock are thought to be due to a massive local release of histamine or adsorption and systemic distribution of the antigens, which may be accelerants such as thiurams and carbamates.^{1,8} Morales et al⁶ identified at least four latex polypeptides as IgE-binding components. We present data showing that latex protein antigens⁵ are adsorbed by the usual contact material (corn powder) from surgical gloves and become potent airborne allergens in surgical units.

We investigated nine surgeons or theatre nurses, a female neurologist, and a patient who had had repeated immediate-type cutaneous reactions associated with dyspnoea, rhinitis, conjunctivitis, Quincke oedema, and/or hypotension. 9 months previously the patient had had shock and generalised urticaria during appendectomy. Natural latex milk, diluted 1 in 100 with saline, produced typical wheal-and-flare reactions and positive radioallergen sorbent test (RAST) results (range, 0.7–53 PRU/ml) in all cases. To study the clinical relevance of airborne material from latex gloves we did exposure tests with latex-free and latex-containing gloves.

20 pairs of latex-free gloves did not cause symptoms, apart from mild nasal irritation in three cases. Challenge by handling 1 to 20 pairs of latex gloves for 4–30 min immediately produced sneezing and rhinorrhoea in all cases; four people became short of breath and wheezed (figure); seven had conjunctivitis, three had urticaria on



Specific airway resistance after challenge tests with airborne powder from latex gloves.

Numbers refer to cases (table).

INHALATIONAL CHALLENGE TESTS

Case	Specific IgE (PRU /ml)	Inhalation challenge tests					
		Pairs of gloves	Exposure (min)	Symptoms			
				R	C	D	U
<i>Surgeons</i>							
1	0.7	20	15	+	+	+	-
2	15.3	1	5	+	+	+	-
3	2.2	20	30	+	+	-	-
<i>Neurologist</i>							
4	2.3	1	5	+	+	-	+
<i>Nurses</i>							
5	1.8	20	20	+	-	+	-
6	12.9	20	30	+	+	-	-
7	3.3	20	30	+	+	-	+
8	53.0	1	11	+	-	+	-
9	22.3	1	10	+	-	-	-
10	0.4	20	30	+	-	-	-
<i>Patient</i>							
11	15.7	1	4	+	+	-	+

All probands firstly handled 20 pairs of vinyl gloves covered with corn powder for 30 min. Afterwards, latex gloves were handled in the same manner whilst wearing latex-free gloves. We started with one pair for 5 min; if no symptoms occurred, we used 20 pairs for up to 30 min. Exposure was immediately stopped when clinically relevant reactions were seen. By means of body plethysmography, specific airway resistance (sRaw) was measured at rest, after handling latex-free gloves, and every 10–30 min until the third hour after handling latex gloves. Four people reported dyspnoea and significant increases of sRaw (>100%) reaching values of more than 2 kPa.s were observed in all of these cases (see figure).

*Associated with significant increase in specific airway resistance (figure). Additional symptoms were: cough (cases 3, 5), hypotension (4, 11), and Quincke oedema (4). The only reaction to exposure to 20 pairs of latex-free gloves (control) was mild nasal irritation in cases 1, 5, and 11.

R = rhinitis, C = conjunctivitis, D = dyspnoea, U = urticaria.

the upper arms and/or the face or Quincke oedema, two had cough, two hypotension, and one had systemic symptoms (table). The type and intensity of reactions were not closely related to levels of latex-specific IgE antibodies—eg, the doctor with systemic symptoms had a RAST value of only 2.3 PRU/ml. Five controls, not sensitised to latex, did not have any symptoms in challenge tests done under the same conditions.

These findings show that latex components act as antigens not only on the skin but also via inhalation because they are transferred from gloves to powder, which becomes airborne. This represents a hazard to medical staff and to sensitised patients. If one individual is sensitised, the whole operating-room team should wear latex-free gloves. We suggest a check on previous hypersensitivity reactions to latex for all surgical patients since direct contact with gloves (or airborne powder), intubation tubes, ventilation masks, and other equipment made of latex may elicit life-threatening reactions.^{1,3,6,8} In doubtful cases, skin tests and/or measurement of latex-specific IgE antibodies in serum are recommended.

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DORIS JÄGER

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