Experimental dermatology • **Original article**

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Clinical and Experimental Dermatology

Latex allergy: assessment of knowledge, appropriate use of gloves and prevention practice among hospital healthcare workers

F. Al-Niaimi,[1] Y. Z. Chiang,[2] Y. N. Chiang[3] and J. Williams[1]

[1]*The Dermatology Centre, Salford Royal NHS Foundation Trust, Manchester, UK;* [2]*Department of Dermatology, Worcestershire Acute Hospitals NHS Trust, Worcester, UK; and* [3]*Core Medical Trainee, Mersey Deanery, Liverpool, UK*

doi:10.1111/j.1365-2230.2012.04450.x

Summary

Background. Healthcare workers and patients are often exposed to natural rubber latex (NRL) through contact with gloves and various healthcare products, which can potentially cause allergic reactions, with varying degrees of severity. In 2008, the Royal College of Physicians published their first evidence-based guidance on occupational health interventions for latex allergy, which emphasized the importance of healthcare workers having knowledge of latex allergy.

Aim. This study aimed to survey the knowledge of healthcare workers (n = 156) about latex gloves and NRL allergy, routine prevention practice and the appropriate use of gloves in patient care.

Methods. Healthcare workers in a large teaching hospital were surveyed using a standard questionnaire.

Results. We found that only 1% of healthcare workers were able to correctly match the appropriate gloves to the specifically designed procedure. More than half (n = 74.53%) were unable to recognize the presentation of type 1 allergy to NRL. Of the 156 participants, 131 (84%) considered that they would benefit from training about NRL allergy and the use of different types of gloves in clinical care.

Conclusions. This survey indicates the importance of education regarding appropriate use of gloves and prevention of NRL allergy among healthcare workers, and dermatologists should play an important role in facilitating this.

Natural rubber latex (NRL) products are widely used in the healthcare setting, particularly examination gloves. In the 1980s, allergy to NRL proteins emerged as an important occupational health problem, with potential allergic reactions ranging from contact urticaria to life-threatening anaphylaxis.[1] Healthcare workers (HCWs) are a high-risk group, with reported prevalence of type 1 allergy to NRL in HCWs of 2–17%.[2–5] In 2008, the Royal College of Physicians published their first evidence-based guidance on occupational health interventions for latex allergy. In that document, evidence was provided to show that knowledge of latex allergy and avoidance of powdered latex gloves are the most effective interventions in reducing symptoms of latex allergy among affected HCWs and patients.[1]

In this study, we surveyed the level of knowledge among HCWs of latex gloves and NRL allergy, routine prevention practice, and appropriate use of gloves in patient care.

Report

Informed consent was obtained from participants. This survey was approved by the local audit department.

During a period of 30 days in December 2010, we surveyed 156 HCWs in a large university teaching hospital. We designed a questionnaire consisting of 16 main stem questions, which aimed to gather data about:

Correspondence: Dr Firas Al-Niami, Specialist Registrar, Salford Royal NHS Foundation Trust, Stott Lane, Manchester, M6 8HD, UK
E-mail: firas55@hotmail.com

Conflict of interest: none declared.

Accepted for publication 10 April 2012

(i) knowledge of different types of gloves and their appropriate use, (ii) routine prevention practice, and (iii) understanding of the risk factors for latex allergy and presentation of allergic reactions.

The χ^2 test was used to calculate significant differences between categorical variables. Statistical significance was set at $P < 0.05$. SPSS software (version 16.0; SPSS Inc., Chicago, IL, USA) was used to analyse the data.

The 156 participants comprised 69 doctors (44%), 46 nurses (29%) nurses and 41 people (26%) designated as 'other healthcare professionals' (OHCPs, including physiotherapists, occupational therapists and clinical support workers). Of these, 53% (n = 34) worked in medical specialties, 28% (n = 19) in surgical specialties, 16% (n = 12) in the accident and emergency department, and 3% (n = 4) in other specialties (e.g. psychiatry and obstetrics and gynaecology).

Most HCWs (90% overall; 84% of doctors and 95% of nurses and OHCPs; $P < 0.05$) thought that they were aware of the different types of gloves available in their department. Of these, 33% (n = 51) said that they had been informed about the different types of gloves available, and 24% (n = 37) had received some training in dealing with latex allergy.

Overall, 64% (51% of doctors and 75% of nurses and OHCPs; $P < 0.01$) expressed confidence in choosing the most appropriate glove(s) to use with their patients for specific clinical tasks. When shown the different types of gloves (i.e. latex, vinyl and nitrile gloves) and asked to match accordingly, 95% (n = 121) correctly identified latex gloves, 78% (n = 120) vinyl gloves and 77% (n = 148) nitrile gloves; 76% (n = 118) were able to correctly identify all three different types of gloves (Fig. 1a). However, overall, only 6% (n = 9) were correct in identifying the appropriate glove(s) for each specific task; when given specific clinical scenarios, 1% of HCWs were able to correctly match appropriate gloves to all given scenarios. The breakdown percentage of doctors and OHCPs for each given task and scenario are shown in Fig. 1b,c.

We further surveyed HCWs about their routine latex allergy prevention practice. We found that only 25% (n = 39) routinely checked for latex allergy when asking patients about their allergy status (Fig. 2a), whereas 21% (n = 32) routinely checked for latex allergy when approaching patients with gloves (Fig. 2b).

When asked about the presentation of allergic reactions, 47% (n = 74) correctly identified the presentation of a type 1 allergic reaction (Fig. 3a). Only 10% (n = 15) correctly identified the risk factors for developing contact dermatitis (Fig. 3b) and 12% (n = 19) were aware of rubber accelerators as potential allergens in rubber gloves (Fig. 3c).

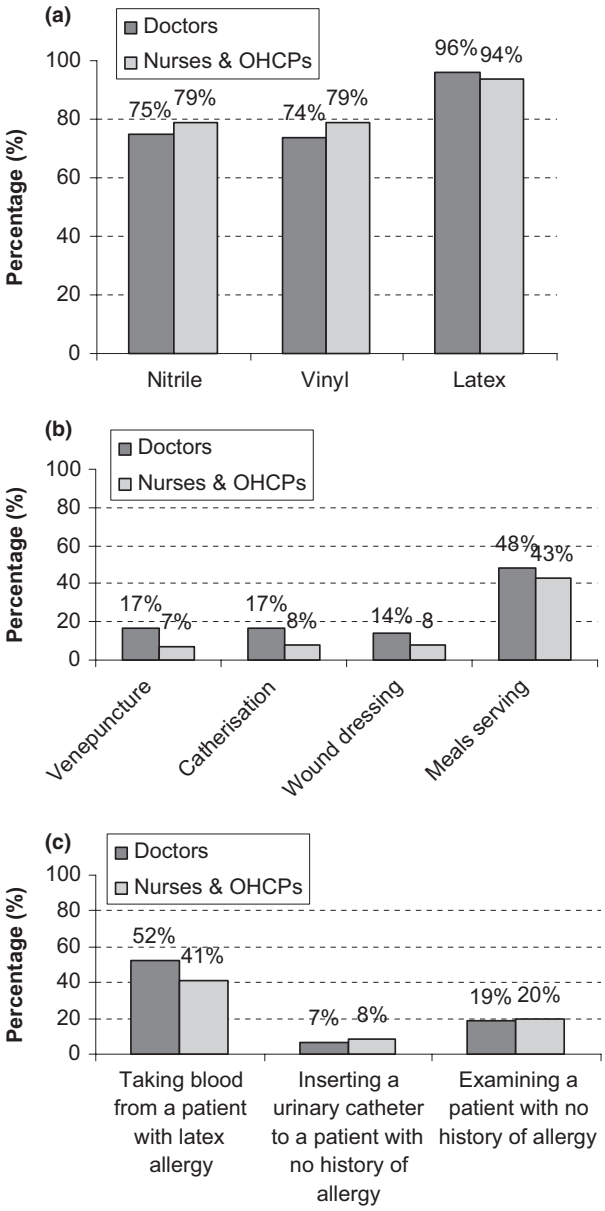

Figure 1 Correct identification of (a) type of gloves (P = 0.10; not significant); (b) type of gloves for specific tasks; (c) appropriate use of gloves for given scenarios.

Overall, 84% (n = 131) felt that they would benefit from training in NRL allergy and the use of different types of gloves in clinical care, and were unsure about how to fulfill this need.

This survey provides information on the knowledge of latex allergy and prevention practice by HCWs, and

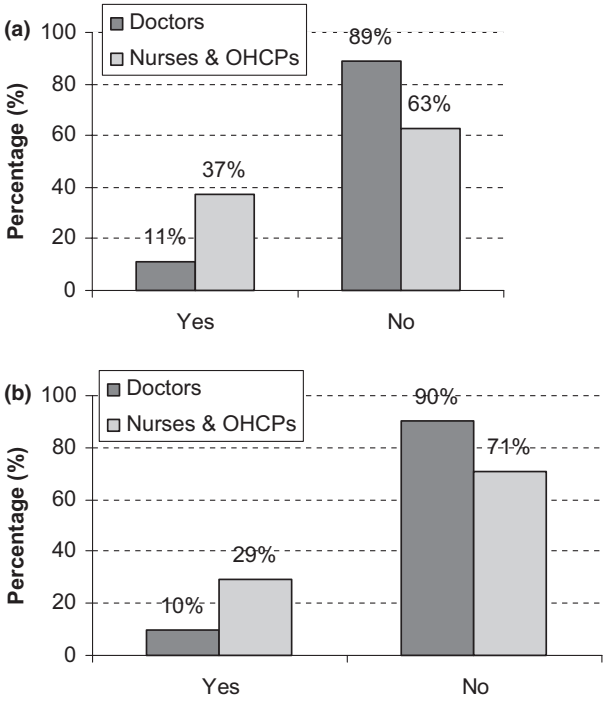

Figure 2 Number of healthcare workers who perform a routine check for latex allergy when (a) asking about allergies ($P < 0.001$), and (b) when approaching patients while wearing gloves ($P < 0.80$).

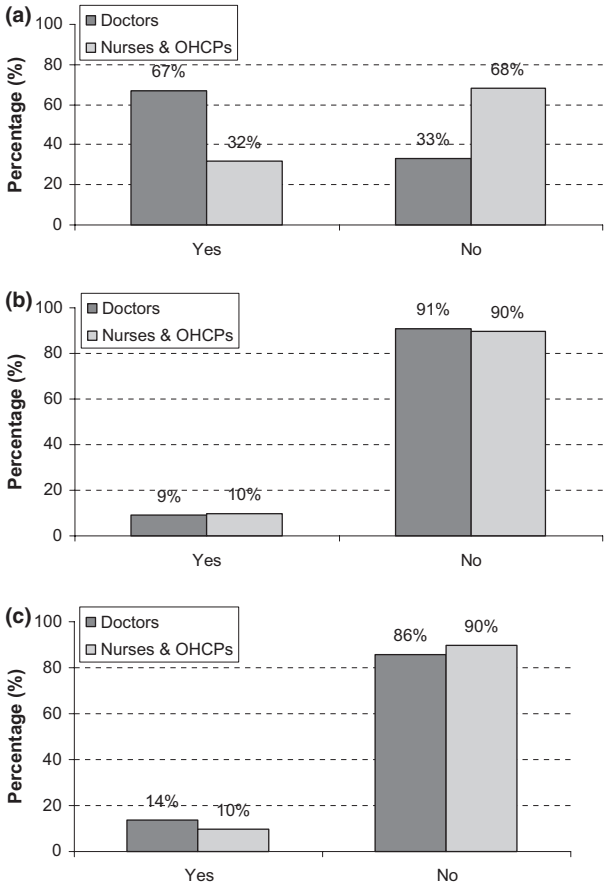

Figure 3 Correct identification of presentations of (a) type 1 allergy to natural rubber ($P < 0.001$) and (b) risk factors for contact dermatitis ($P = 00.8$). (c) Awareness of rubber accelerators as potential allergens ($P = 0.40$).

highlights a lack of knowledge in this area. Although more than half of participants expressed confidence in choosing the appropriate gloves for their patients and a similar proportion were able to correctly identify the different types of gloves, less than a third were able to correctly choose the most appropriate gloves to specific clinical tasks and given scenarios. This can potentially pose safety issues to patients, and highlights the need for further training in this area.

NRL is increasingly incorporated in various healthcare products, which may lead to an increase in allergic reactions in patients and HCWs. Our survey found that nurses and other HCWs are significantly more likely than doctors to check for a history of latex allergy when dealing with patients. This was in contrast to their relative difficulty in their ability to recognize the presentation of type 1 allergy to NRL compared with doctors. It is important to check for history of latex allergy and be able to recognize the presentation of an allergic reaction in order to prevent, or if necessary, to initiate timely management for latex allergy.

Awareness of other potential allergens such as rubber accelerators in gloves may facilitate a reduction in allergic reactions.[6] NRL is harvested from the *Hevea brasiliensis* tree. Before manufacture, various chemicals are added, including ammonium hydroxide, formaldehyde or zinc oxide to prevent coagulation, deterioration and bacterial growth. This is followed by the addition of antioxidants and accelerators (including thiurams, carbamates and/or mercapto compounds) to enhance the barrier properties of latex. Finally, powder is added to facilitate donning and removal of gloves.[7] Therefore, HCWs should be aware that exposure to latex involves a mixture of chemicals that are all potential allergens. However, only 12% of HCWs were aware of rubber accelerators as potential allergens in latex and rubber gloves.

Koh *et al.*[8] found that the levels of NRL allergens in gloves are sufficiently high to cause NRL allergy in sensitized people, suggesting the need for regulatory interventions to encourage manufacturers to produce gloves with low levels of NRL allergens. Regulatory interventions combined with educational efforts can

help to improve NRL allergy prevention. A study carried out in the German healthcare system showed an associated decline in the number of suspected cases of occupational allergies caused by NRL after education and regulatory interventions.[9] Currently, the Medical Devices Agency (MDA) of the Department of Health recommends a policy on the management of latex sensitization/allergy to be implemented within any healthcare establishment in the UK.[10] Suggested measures to minimize the occurrence and effect of latex allergy include: education of staff about management of latex allergy, routine questioning of patients about previous reactions to latex-based products, provision of alternatives to latex-based devices, production of purchasing data on the amount of extractable protein content in gloves, and recording of adverse reactions to latex products. However, the MDA states that no definitive guidance can be provided to purchasers on what protein levels can be regarded as safe. Nonetheless, concerns about latex sensitization have resulted in a general reduction in extractable protein levels to below 100 μg/g in surgical and powder-free examination gloves.[10]

In conclusion, this survey has identified that most healthcare professionals do not routinely check for latex allergies, potentially exposing patients to the unnecessary risk of allergic reactions. Most are aware of the different types of gloves, but there is still a lack of knowledge in choosing the appropriate gloves for specific clinical tasks. There is a need for education among HCWs about gloves and NRL allergy, and dermatologists have a role to play in instigating the necessary education and preventative measures for reducing latex allergy in the workplace.

Learning points

- In this study, most healthcare professionals did not check for glove allergies routinely, potentially exposing patients to the unnecessary risk of allergic reactions.
- Most were aware of the different types of gloves, but matching appropriate gloves to clinical tasks was poor.
- There is a need for education among HCWs about gloves and NRL allergy,
- Dermatologists have a role to play in education for the prevention of latex allergy.

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