



Guidance for the prevention of latex allergy:

Summary

Latex allergy is a major, and potentially life threatening occupational hazard in health care and laboratory environments, for which there is currently no cure. The use of latex (1) gloves can cause dermatitis and asthma in roughly one in ten of those who use them. In a small number of cases persons who have been sensitised to latex are at serious risk of a potentially fatal anaphylactic shock if they are further exposed to even minute traces of the substance. Research has shown that the risk of allergic response is greatly increased if powdered latex gloves are used. The only effective approach to latex allergy is education, prevention, control and symptomatic treatment. Employers have a legal duty to undertake adequate risk assessments and to take measures to prevent, or adequately control, exposure to latex, in order to provide a safe working environment.

Introduction

Latex allergy is a well-known and increasing problem in healthcare and laboratory workers. The increased incidence of this problem is mainly due to the increased use of such gloves for protection against blood-borne viruses, and the need to protect certain types of work from contamination. However in many cases the choice of latex gloves is made purely on economic grounds with little reference made to the potential for allergic reaction and sensitisation, or indeed the suitability of latex as an effective barrier against a particular hazard e.g. there are few chemicals, with the exception of ketones such as acetone, against which latex should be regarded as first choice protection. Whilst latex offers excellent protection against blood-borne viruses and other biological hazards and should be regarded as first choice protection against these hazards, there are alternatives, such as nitrile and neoprene, which will, subject to risk assessment, adequately protect against many body fluids and cleaning agents. The use of these alternatives may be indicated particularly where atopic (persons with a tendency to have multiple allergic conditions), or already sensitised, persons are present.

Glove choice for protection against chemical hazard should be made only after reference to a manufacturers chemical resistance chart, or the hand protection Guidance Note.

Nitrile and Butyl offer good protection against many chemicals but certain chemicals, especially where immersion is concerned, will require protection with quite specific glove materials.

Latex products are manufactured from a milky fluid derived from the sap of the rubber tree. Some proteins in natural rubber latex can trigger a range of mild to severe allergic reactions and can sensitise certain individuals. Once sensitisation has taken place, persons are likely to experience adverse allergic reaction when further exposure to even minute traces of the

substance to which they are sensitised occurs, in the case of latex this can have serious consequences, not only for their health but also their future employment prospects, as many products in the healthcare and laboratory environment contain latex. There are many household products that contain latex but the wider general public, whose only contact with latex is through this general use of the products, rarely experience health problems from their use of these products; it is workers who habitually use latex products that are at a potentially greater risk.

Workers at increased risk of developing latex allergy are those with ongoing and repeated exposure to latex, individuals who are atopic and those with spina bifida. It is also associated with allergies to certain foods in which the antigens are similar to latex, these are: banana, chestnut, kiwi fruit, papaya and avocado, and to a lesser extent: potato, celery, melon, tomato, hazelnut, pineapple and peanut.

Latex allergy and its symptoms

Definitions (Collins Dictionary of Medicine)

ALLERGY: hypersensitivity to body contact with a foreign substance (an **ALLERGEN**). An allergic response implies that there has been prior contact with the allergen during which the immunological processes leading to hypersensitivity have occurred. (i.e. **SENSITISATION**)

(1) Also known as natural rubber, or natural rubber latex (NRL)

ALLERGEN: any **ANTIGEN** causing **ALLERGY** or causing an allergic reaction in a sensitive person.

ANTIGEN: any molecule recognised by the body as 'foreign', and which will provoke the production of specific **ANTIBODY**.

SENSITISATION: the preliminary exposure of a person to an **ALLERGEN** that leads to **ANTIBODY** production by the immune system and, on subsequent exposure, to an **ALLERGIC** or hypersensitivity reaction.

Types of allergic responses

Immunologists classify allergic responses into four main types, however latex allergy can only be Type I or Type IV, as it does not present as Type II or III. Generally, a Type IV latex allergy evokes a less serious clinical response than does a Type I, however both may result in the sensitised person being unable to continue working in an environment where exposure to latex protein is a possibility, as once sensitised to an allergen, the slightest contact may provoke a recurrence of the symptoms. Indeed, once sensitised, even ordinary everyday items that contain latex may start an adverse reaction. Sufferers have been known to react to household rubber gloves, squash balls, balloons, condoms, shower curtains, etc. - all common objects that contain natural rubber.

Type I allergy

Type I allergy is an immediate sensitivity response to one or more of the naturally occurring proteins in latex. Symptoms appear between five and thirty minutes of exposure and may range from immediate contact urticaria (skin reddening and flare reaction, itchy rash and eczema) to lacrimation, runny nose, breathing difficulties, swelling of the eyelids and lips, and potentially fatal anaphylactic shock is possible. Except in circumstances where anaphylactic shock has occurred, reactions caused by the immediate sensitivity usually subside within two hours of removal of the allergen.

Type IV allergy

Type IV allergy is a response to the chemical accelerators used in the manufacture of the gloves. It is a delayed sensitivity, or allergic contact dermatitis reaction following repeated contact with an allergen. Symptoms include an acute rash, bumps or sores, which usually appear 6-48 hours after exposure; these may spread away from the area initially in contact with the latex product.

Irritant Contact Dermatitis is the most common type of reaction to latex products among health care and laboratory workers and is characterised by dry, itchy irritated areas on the skin, usually the hands where they have been in contact with the latex glove. This is not an allergic reaction and is reversible by avoiding the irritant and the use of emollient creams. The reaction is also associated with repeated hand washing and drying, or incomplete drying, the use of cleaners and sanitizers and exposure to powders added to gloves.

Powdered latex gloves

The risk of latex allergy is greatly increased if powdered latex gloves are used as the latex proteins, responsible for latex allergies, bond with the powder (often cornstarch) so more latex protein reaches the skin, and the powder may also become airborne when the gloves are removed, thus not only the user but others in the area are potentially at risk, as inhaling the powder may lead to respiratory sensitisation. The main reason put forward for the use of powdered gloves is ease of donning, but there is now evidence that non-powdered latex gloves are just as easy to put on and take off, and latex free gloves are just as robust as latex versions.

Glove powder also acts as an abrasive, cracking and drying the skin, causing irritation and contact dermatitis. The broken skin barrier facilitates the easier penetration of infections, and of the chemical accelerators and latex proteins in the glove, thus increasing the risk of both Type I and Type IV allergy

A level of risk of latex allergy remains even in non-powdered latex gloves but is greatly reduced, and this is especially so if low protein level gloves are used i.e. gloves with a protein level < 50mg/g, this level conforms to the proposed European CE standard (2) to which all manufacturers will have to comply, assuming the standard is adopted, when selling latex gloves in the EU.

(2) BS ISO 12243. Determination, using the modified Lowry method, of water-extractable protein in medical gloves made from natural rubber latex (draft document).

It should be noted that so called Hypo-allergenic gloves do not reduce the risk of latex allergy. However, they do reduce reaction to the chemical accelerator additives and thus reduce the risk of allergic contact dermatitis.

Preventive action

Whilst there is no defined level of exposure to latex where it can be said that there is no risk of adverse response, and recognising that most persons do not have adverse or allergic reactions to such exposure, the key factor in preventing latex allergy is to reduce the exposure to latex to as low a level as is reasonably practicable i.e. to a degree that is unlikely to induce sensitisation. Current research shows that this can be achieved, in most instances, by ensuring that where natural rubber gloves (latex) are used these are only of the non-powdered variety and with a maximum free protein content of 50mg/g of glove material.

Unfortunately such action will not be sufficient to eliminate responses in an already sensitised person where there is probably no alternative but to exclude further exposure to latex altogether.

The Health and Safety Executive (HSE) state in published guidance that employers should "implement a purchasing policy which specifies gloves with a low level of extractable (or leachable) protein", and that they should "ensure that powdered gloves are not used when powder-free gloves can reasonably be used". The Royal College of Nursing (RCN) in a published employment brief state "The primary reason for the use of powder in gloves is to promote the ease of donning. However, the adverse consequences of its use, both to users and to patients, significantly undermine the benefits. For this reason the RCN is advocating a complete ban on the use of powdered latex gloves". Many other papers have been published on the subject; references and links to some are appended to this document.

Many hospital Trusts, universities, scientific and pharmaceutical companies in the UK and Europe have followed the above route of risk control as the only viable method of ensuring that the risk is reduced to the lowest practical level. Many have introduced positive purchasing policies where only good quality low protein, non-powdered, gloves are available through their central procurement outlets e.g. the NHS Purchasing and Supply Agency, the NHS' major supplier has removed powdered and high-protein latex gloves from their catalogue

Law

Latex is a substance hazardous to health as defined by the Control of Substances Hazardous to Health Regulations (COSHH). Regulation 7 (1) provides that "Every employer shall ensure that the exposure of his

employees to a substance hazardous to health is either prevented or, where this is not practicable, adequately controlled". Regulation 7 (2) provides that "In complying with his duty of prevention under paragraph (1), substitution shall by preference be undertaken, whereby the employer shall avoid, so far as is reasonably practicable, the use of a substance hazardous to health at the workplace by replacing it with a substance or process which, under the conditions of its use, either eliminates or reduces the risk to the health of his employees".

The HSE have served Improvement Notices against several NHS Trusts for inadequate control of latex hazards and the Court of Appeal in *Dugmore v Swansea NHS Trust and Morrison NHS Trust* (2002) held that the duty imposed by Regulation 7(1) of the COSHH Regulations is an absolute duty. The Court of Appeal accepted that it was not reasonably practicable for a hospital Trust to prevent exposure to latex completely, given the wide range of products that contain it, but found that: "It cannot be adequate control to oblige an employee frequently to wear powdered latex gloves when other barriers are available".

This case law decision makes it extremely difficult for NHS Trusts or other employers of health care or laboratory workers, such as Universities, to resist claims, or defend prosecutions, which involve sensitisation to latex after the enactment of the COSHH Regulations. It is also worth noting that this important decision has implications stretching beyond the specific subject of latex, but must apply equally to all hazardous substances where there is a safer alternative available.

Cost

There is a cost implication in using non-powdered latex gloves and those made from synthetic materials, as they tend to be more expensive than powdered latex gloves, but economics cannot be used as an argument against complying with a duty in law, or indeed against ensuring the adequate protection of employees' health and safety. It is expected that as the demand for non-powdered and synthetic alternatives to latex increases that the cost will decrease.

Policy

The University Health and Safety Department has developed a policy for the control of latex hazard and the reduction of latex allergy risk. This policy forms supporting guidance to the University Health and Safety Policy, as approved by the University Court, and must be adhered to. The policy for the control and prevention of latex allergy can be viewed at:

Further Reading and References

- Control of Substances Hazardous to Health Regulations 2002, Approved Codes of Practice, HSE Books, L5, 2002, ISBN 0 7176 2534 6

- Know how: Latex sensitisation, Jeanes A (1997) Nursing Times, vol 93 no. 40 (October): pp25-28
- Latex allergy in health care settings, Royal College of Nursing, Employment brief 25/99
- Latex allergy: a meeting of minds, Report of the latex summit organised by the National Association of Theatre Nurses and the Latex Allergy Support Group, Congress House London, May 2002
- Latex and you, HSE Books, INDG320, 04/00 in .pdf format at: <http://www.hse.gov.uk/pubns/indg320.pdf>
- Latex sensitivity in dental students and staff: a cross sectional study, Tarlo S, et al, (1997) Journal of Allergy and Clinical Immunology, vol99 no.3 (March):pp. 391-401
- Personal Protective Equipment at Work, Guidance on the 1992 Regulations, HSE Books, L25, ISBN07176 0415 2
- Preventing Allergic Reactions to Natural Rubber Latex in the Workplace (DHHS (NIOSH) Publication No. 97-135, June 1997) and available on the web at <http://www.cdc.gov/niosh/latexalt.html>
- Preventing asthma at work, How to control respiratory sensitisers, HSE Books, L55, 1994, ISBN 0 7176 0661 9
- The gloves are off! Latex and asthma, Gallagher J, TUC/National Asthma Campaign, Congress House London November 1997
- Think twice before reaching for natural rubber PPE, A latex glove alert, Nagel M, American Chemical Society; Chemical Health & Safety Nov/Dec1997, 4(6), 14-18, at: <http://pubs.acs.org/hotartcl/chas/97/novdec/latex.html>
- Thoughts on latex allergy, Enviroderm Services Technical Bulletin No.6, at: <http://www.enviroderm.co.uk/tech.htm>
- NHS Plus, Royal College of Physicians, Faculty of Occupational Medicine. Latex allergy: occupational aspects of management. A national guideline. London: RCP, 2008. Summary Leaflet for Employers. <http://www.rcplondon.ac.uk/pubs/contents/9f57b7f8-9304-41ba-ae87-7322c7ed6d85.pdf>
- NHS Plus, Royal College of Physicians, Faculty of Occupational Medicine. Latex allergy: occupational aspects of management. A national guideline. London: RCP, 2008. Summary Leaflet for Employees <http://www.rcplondon.ac.uk/pubs/contents/6d12dd5b-9798-4e84-ba51-1cddb621c463.pdf>

Glove selection and guidance

- The choice and use of chemically resistant gloves, School of Chemistry University of Bristol, at: <http://www.chm.bris.ac.uk/safety/gloves.htm>
- Ansell's online chemical glove selection guide <http://www.ansellpro.com/specware/guide.asp>
- Best online chemical resistance guide <http://www.bestglove.com/>

Web links of latex exposure interest:

- <http://diannebrownson.tripod.com/latex.html>
- <http://medi-smart.com/anes4.htm>
- <http://www.enviroderm.co.uk/tech.htm>
- <http://www.lasg.co.uk/latexallergy/LatexListSept07.pdf> - list of some common, non-medical items which do contain latex and some possible alternatives.

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