14. Evaluation of the Skin's Role in Natural Rubber Latex Induced Hypersensitivity

Benjamin B. Hayes, Albert E. Munson, and B. Jean Meade
National Institute for Occupational Safety and Health, United States

Over the past decade, type I immediate hypersensitivity to natural rubber latex (NRL) has become a significant health problem in the United States. NRL is a complex, intracellular product of the laticiferous cells in the rubber tree *Hevea brasiliensis*. Laticifers consist of 40–50% cytosol, 30–45% cis-polyisoprene polymers (rubber particles), 10–20% lutoid vesicles, 0.6% proteins, and the remainder being various minerals and ions. Although manufacturers attempt to remove them, proteins (5-100+ kDa) left in the finished latex product are responsible for the IgE-mediated cascade. Health care worker (HCW) exposure and sensitization to latex proteins are thought to occur mainly via inhalation and dermal exposure. Major efforts to reduce inhalation exposures are being implemented worldwide which would lessen the role of respiratory sensitization. The other route of latex sensitization is via percutaneous absorption, but it has been postulated that molecules greater than 1 kDa in size are unable to penetrate an intact skin barrier. Therefore, the purpose of these studies was to evaluate the skin's role in NRL sensitization. Initial studies investigated the sensitization potential of non-ammoniated (NAL) latex proteins in the murine local lymph node assay and a draining lymph node phenotyping assay. Groups of female Balb/c mice were topically exposed to NAL for 4 consecutive days (days 1-4), radioassayed on day 5, and phenotyped on day 10. In these intact skin models, no immune response was demonstrated as evidenced by a lack of increase in lymph node proliferation or alterations in CD3+, CD4+, CD8+, IgE+, or B220+ cells (as compared to controls). However, most conditions for HCW latex exposure involves irritated, abraded, and occluded skin conditions. Therefore, subsequent studies evaluated the potential for latex proteins to penetrate different skin conditions. Using *in vitro* diffusion models for intact, irritated, abraded, and occluded skin, penetration studies will measure the penetration of latex proteins through human and animal skin.

7th Joint Science Symposium on Occupational Safety and Health

26-29 October 1998
Hidden Valley, PA
USA

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7th Joint Science Symposium on Occupational Safety and Health

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Hidden Valley, Pennsylvania
United States

Arranged by

National Institute for Working Life
SE–171 84 Solna, Sweden

Institute of Occupational Health
Topeliuksenkatu 41 a A
SF–00250 Helsinki, Finland

National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, Ohio 45226–1998
United States