

Correlation of protein levels with skin prick test reactions in patients allergic to latex

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Background: Natural rubber latex (NRL) gloves are the major source of proteins that cause latex allergic reactions in sensitized health care workers and patients.

Objective: This study evaluated the effect of manufacturing changes on reducing protein, antigen, and allergen levels of latex medical gloves.

Methods: Three types of NRL gloves were manufactured with a common batch of compounded latex. The NRL gloves were analyzed for total protein by using the American Society for Testing and Materials D 5712-95 Lowry method, and specifically for latex proteins by immunoassay. Allergen levels in the extracts were determined by end-point titration skin prick tests (SPT) on protein allergic to NRL.

Results: Extracts from regular powdered gloves had detectable levels of latex proteins and allergens (62% SPT positive), whereas the powder-free gloves were low in protein content and allergenicity (5% SPT positive). No significant difference in SPT reactivity was observed between the chlorinated powder-free gloves and the polymer-coated gloves. Although the protein levels determined by the Lowry assay correlated with the SPT reactivity ($r=0.95$), the test was restricted by a high detection limit (9.3 $\mu\text{g/ml}$). Fifty-eight percent of patients allergic to latex reacted at the 50 $\mu\text{g/gm}$ detection limit allowed by the Food and Drugs Administration. The ELISA had a good correlation with SPT reactivity ($r=0.93$), and because of the greater sensitivity, glove testing below ELISA reporting limit (0.06 $\mu\text{g/ml}$) have a significantly lower potential for eliciting reactions in patients allergic to latex.

Conclusion: Results of protein assays are acceptable criteria with which to rate the potential allergenicity of gloves; however, the American Society for Testing and Materials D5712-95 assay may lack the sensitivity to provide clinically relevant data.