Medical News

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Latex Sensitization Among Healthcare Workers

Although there are several reports of the prevalence of latex sensitization among healthcare workers, the incidence of sensitization is unknown. Dr. Gordon Sussman and colleagues from the University of Toronto, Ontario, Canada, reported a study of sensitization among latex-glove users at a hospital in Hamilton, Ontario. Workers with negative results to a latex skin-prick test (SPT) at baseline were followed prospectively over 1 year, some wearing powdered gloves and others using powder-free gloves. Workers then completed a questionnaire and were evaluated for SPT sensitivity to latex reagents, three common inhalants, and six foods. A conversion was defined as a (new) latex SPT with wheal diameter at least 4 mm greater than saline control. Glove extracts were assayed for antigenic protein, and air samples were obtained to estimate exposure to airborne latex protein.

During powdered-glove use, personal exposures ranged from 5- to 616-ng/m^3, whereas during powder-free glove use, all but two results for air samples were below the limit of detection (approximately 0.1 ng/m^3). During the study period, the protein concentration in the powdered gloves, initially mean 557 µg/g of sample, declined at a rate of 295 µg/g per year ($P<.0001$). Of the 1,075 SPT-negative participants at baseline, 479 were working in eligible wards; of these, 435 (91%) participated in follow-up, 227 using powder-free gloves and 208 using powdered gloves. There were 4 conversions, 2 (1%) in the powdered-glove group and two (0.9%) in the powder-free group. The 2 participants using powdered gloves were the only converters who were symptomatic. The significance of skin-test conversions identified in the powder-free group, both of whom were asymptomatic, was unclear.

The authors believe that this study represents the first reported estimated (approximately 1%) of the incidence of sensitization in hospital personnel using latex gloves. They also point out that the limitations of the study, including the decline in latex protein concentration and the possibility of information (observer) bias. This study has important implications in light of the increased emphasis on the more expensive powder-free latex gloves that are believed to reduce sensitization to latex.

FROM: Sussman GL, Liss GM, Deal K, Brown S, Cividino M, Siu S, et al Incidence of latex sensitization among latex glove users. *J Allergy Clin Immunol* 1998;101(2 pt 1):171-178.

Sporicidal Activity of Low-Temperature Sterilization Technologies

William Rutala and colleagues from the Division of Infectious Diseases, University of North Carolina–Chapel Hill, conducted a study to evaluate the efficacy of four new low-temperature sterilization technologies: ethylene oxide with hydrochlorofluorocarbons, a liquid peracetic acid immersion system (Steris System 1 Processor, Steris, Mentor, OH), and two plasma sterilization processes that use vaporized hydrogen peroxide (STERRAD 100 and the STERRAD 100S, Advanced Sterilization Products, Irvine, CA). The STERRAD 100S system potentially improves sterilizer efficacy by using two cycles of a diffusion stage and a plasma stage per sterilization cycle. Flat stainless-steel carriers were inoculated with approximately 10^6 *Bacillus stearothermophilus* spores. These carriers were placed aseptically in the middle of 40-cm-long hollow stainless-steel tubes. Two types of tubes were used: (1) a lumen test unit with a removable 5-cm center piece (1.2-cm diameter) of stainless steel sealed to the narrower steel tubing by hard rubber septa and (2) a straight lumen. Three different diameters of the lumen test unit (1-, 2-, and 3-mm) and a single diameter of the straight lumen (3-mm) were studied. At least 40 replicates were performed for each type of lumen and sterilization method. After inoculation, the test unit was placed in one of the low-temperature sterilization systems. After sterilization, the carriers were incubated in trypticase soy broth for 14 days at 55ºC and assessed for growth of *B stearothermophilus* spores.

The results demonstrated that ethylene oxide with hydrochlorofluorocarbons, the STERRAD 100S, and the STERRAD 100S half cycle were highly effective in killing approximately 10^6 *B stearothermophilus* spores present in the center of narrow-lumen stainless-steel tubes. As the lumen diameter decreased, the STERRAD 100 demonstrated reduced ability to kill all *B stearothermophilus* spores present on the carrier. This was especially true for the smallest and most challenging diameter tested (1-mm).The Steris System 1 was not effective in completely eliminating the 10^6 inoculum under test conditions.

It was concluded that the cycle parameters of the STERRAD 100S were superior to the STERRAD 100 system and equivalent to ethylene oxide with hydrochlorofluorocarbons. Introduction of this new STERRAD 100S system should improve the margin of safety and reduce processing costs by its use of a shorter cycle time. The Steris System 1 is limited by diffusion of the chemical sterilant into the interior of the lumen test unit.