Letters to the Editor

Serratia marcescens Outbreak Associated With Extrinsic Contamination of 1% Chloroxylenol Soap

To the Editor:

In a recent article, Archibald et al[1] reported extrinsic contamination of a 1% chloroxylenol-containing soap product with *Serratia marcescens*. Over the years, a number of articles have appeared in the published literature reporting microbial contamination of antiseptic, antimicrobial, and disinfectant products containing a variety of active ingredients, including quaternary ammonium compounds, chlorhexidine, and triclosan. Archibald gives reference to some of these reports. The conclusion often drawn is that the active ingredients used in these products are not effective because the product is found to carry viable microbes. However, the problem could be more complex and involve a failure in product formulation stability and preservation. The primary function of some antimicrobial chemicals (ie, active ingredients) is to exert an immediate or residual antimicrobial effect on skin. In essence, the product is a delivery vehicle for the active ingredient. However, even though these active ingredients are antimicrobial, they are not designed to function as product preservatives. Wash products often contain a high percentage of water (up to 80% of the total formulation). Antimicrobial active ingredients such as triclosan and chloroxylenol are practically insoluble in water and are essentially hydrophobic. In the case of an aqueous product, a preservative (or preservative system) should be water soluble to be readily available to potential microbial contaminates residing in the aqueous phase. Cationic antimicrobials, such as quaternary ammonium compounds, can be partially or completely deactivated by natural soaps and certain classes of surfactants. Preservatives are a separate and distinct class of antimicrobial chemicals designed specifically to protect a product from microbes unintentionally introduced during manufacturing or use in the field.

In addition to an active ingredient, manufacturers of antimicrobial wash products must include an effective, persistent, stable, and broad-spectrum preservative system to resist contamination. Preservative efficacy should be confirmed by using standard challenge (and rechallenge) testing to verify that it works over the intended shelf-life of the product. It also is important that product dispensers be designed properly to minimize the introduction of microbes from outside the container, either from the users or the immediate environment.

REFERENCE

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Stephen Spainhour, BA
Ciba Specialty Chemicals
High Point, North Carolina

The authors reply.

We would like to thank Mr. Spainhour for his comments, which we think add to the general body of published knowledge on contamination of antiseptic, antimicrobial, and disinfectant products. The point is well taken that the problem could have involved a failure in product formulation, stability, or preservation. In our article, we did not imply that the active ingredient (1% chloroxylenol) was ineffective because the opened bottles of soap carried viable *Serratia marcescens,* nor did we envisage 1% chloroxylenol as a product preservative.

We agree that all formulations of antimicrobial wash products should contain an antimicrobial preservative and that there should be quality control checks to ensure efficacy of this preservative over the intended shelf-life of the product. Some manufacturers tend to treat the identities of the antimicrobials that are used as preservatives in their various formulations as a corporate secret. The 1% chloroxylenol soap preparation referred to in our article contains a polyquaternium disinfectant. It has been reported previously that *S marcescens* can survive in solutions with a polyquaternium for up to 72 hours.[1]

The teaching points in our article were essentially that (1) antimicrobial soaps can be responsible for the propagation of nosocomial pathogens in intensive-care units with high-risk patient populations; (2) personal bottles of soap, carried by healthcare workers, should not be used in intensive-care units; and (3) soap dispensers should be designed properly to minimize extrinsic contamination with nosocomial pathogens, and this could be achieved by using wall dispensers operated by foot-activated pumps.

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Lennox K. Archibald, MD
Centers for Disease Control
and Prevention
Atlanta, Georgia
Bhavesh Shah, MD
Ann Corl, RN
Myrna Schulte, RN
Donna J. Fisher, MD
Barbara W. Stechenberg, MD
Baystate Medical Center
Springfield, Massachusetts
William R. Jarvis, MD
Centers for Disease Control
and Prevention
Atlanta, Georgia

A Cluster of Drug-Resistant *Streptococcus pneumoniae* Among Nursing Home Patients

To the Editor:

The New York City Department of Health (NYCDOH) noted that three clinical isolates of drug-resistant *Streptococcus pneumoniae* ([DRSP] two from blood and one from tracheal aspirate) had been reported from three residents of the same nursing home during September 15 to 25, 1996. All three residents had been transferred to the same hospital with acute pneumo-

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nia. An epidemiological investigation was undertaken to assess factors related to acquisition of DRSP in the nursing home. Because pneumococcal vaccination rates for all residents were determined to be low (2%), a formal program to vaccinate all residents of the nursing home was implemented.

The nursing home is a 240-bed residential facility that is divided into six 40-bed units; 25 beds are occupied by patients requiring ventilator-assisted breathing. None of the patients was known to be seropositive for the human immunodeficiency virus. Epidemiological information designed to identify risk factors for acquisition and transmission of DRSP was collected on standardized questionnaires. Information on the three DRSP isolates was obtained from the clinical microbiology laboratory of the hospital, but the isolates were not available for further characterization by molecular analysis or serotyping.

The three patients were in separate units in the nursing home. Two were ambulatory, and one was ventilator-dependent. They had no known social interaction with one another and did not share common healthcare providers. Two had been hospitalized within the previous 6 months. None had previous pneumococcal disease within the preceding 12 months, nor received visits from children <12 years of age during the preceding 6 months. All three had underlying chronic illnesses, two were receiving immunosuppressive medications, and all had received antibiotics within the previous 6 months. One patient had never been immunized with pneumococcal vaccine; the immunization status of the other two was unknown. Pneumococcal vaccination rates for all residents was found to be low (2%). This cluster of DRSP isolates was limited to these three residents; no additional cases have been detected among residents. No common exposures were identified.

The DRSP isolates did not have identical antibiotic susceptibility patterns. The minimum inhibitory concentrations (MICs) for penicillin for the three isolates were 2.0 µg/mL, 2.0 µg/mL, and 4.0 µg/mL (E-test). All were sensitive to trimethoprim-sulfamethoxazole and vancomycin. Susceptibility to erythromycin and ceftriaxone varied.

Certain changes were made in pneumococcal immunization practices to assure better immunization rates at the nursing home. First, after obtaining informed consent, the 23-valent polysaccharide pneumococcal vaccine was administered during a 6-week period to 207 (96%) of 215 residents not previously known to be immunized; 8 residents (4%) refused immunization. Residents were monitored actively by the nursing staff for side effects to immunization (fever >100°F without other causes, myalgia, local erythema with pain, and anaphylaxis) and for illness compatible with DRSP. Two of the vaccinated patients (previously unimmunized) developed fever within 36 hours following vaccination. It was determined later that a vaccinated patient who did not develop side effects had been vaccinated more than 2 years previously.

Second, to ensure that pneumococcal immunization became a routine requirement for admission to the home, immunization policies were modified by the introduction of an immunization cover sheet to the front of each medical chart and by addition of a standing order for pneumococcal immunization within 7 days unless documentation of previous vaccination existed.

The NYCDOH mandated the reporting of antibiotic-resistant *S pneumoniae* in 1994. During the first 6 months of 1996, 16% of all blood isolates in New York City demonstrated intermediate penicillin susceptibility (2µg/mL>MIC≥0.1 µg/mL), and 6% showed high-level resistance (MIC≥2.0 µg/mL; NYCDOH, unpublished data, 1996). Over the past several years, nosocomial outbreaks of DRSP have been reported in New York City, including in a chronic-care facility for children[1] and a long-term–care facility for patients with acquired immunodeficiency syndrome (NYCDOH, unpublished data, 1996). Three outbreaks of pneumococcal pneumonia in chronic-care facilities have been reported recently from other states in which pneumococcal vaccination rates were low.[2]

Recommendations for prevention and control of infections in nursing homes include routine administration of 23-valent polysaccharide pneumococcal vaccine to all residents.[3] In spite of this, pneumococcal immunization rates for all US adults aged ≥65 years of age remain low.[4] Our experience at this nursing home highlights the missed opportunity that may occur in many long-term–care facilities to prevent invasive disease from *S pneumoniae* and, importantly, drug-resistant isolates. In our experience, pneumococcal vaccination was well tolerated by residents. The implementation of formalized pneumococcal immunization admission practices should provide improved vaccine coverage among residents of such facilities. However, more information is needed to assess the effectiveness of such policies, the occurrence of uncommon but serious side effects, and the effects of vaccination on the epidemiology of DRSP infections.

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David F. McNeeley, MD
Cornell University Medical College
New York City, New York
Janet Lyons, RN
Salvatore Conte, MD
Splitrock Nursing Home
Bronx, New York
Anne Labowitz
Marcelle Layton, MD
New York City Department of Health
New York City, New York

The Stethoscope and Potential Nosocomial Infection

To the Editor:

In a recent letter, Dr. Brook noted the potential role the stethoscope may play in the nosocomial transmission of bacteria.[1] He referred to a study by Breathnach et al[2] that documented the isolation of bacteria (notably gram-positive cocci) from the majority of stethoscope diaphragms utilized in a pediatric population. They isolated gram-negative organisms from a minority of stethoscopes, with *Staphylococcus epidermidis* being the