

Outbreak Linked to Artificial Fingernails (7/04)

Outbreak of extended-spectrum beta-lactamase—producing *Klebsiella Pneumoniae* in a neonatal intensive care unit linked to artificial nails. Gupta A, Della-Latta P, Todd B, San Gabriel P, Haas J, Wu F, Rubenstein D, Saiman L. Infect Control Hosp Epidemiol 2004;25:210–215.

This article describes the investigation of an outbreak of extended-spectrum beta-lactamase (ESBL)-producing *Klebsiella pneumoniae* infections in a neonatal intensive care unit. Cultures of the gastrointestinal tracts of patients, the hands of health-care personnel (HCP), and the environment were performed to detect potential reservoirs for ESBL-producing *K. pneumoniae*. Strains of *K. pneumoniae* were typed by pulsed-field gel electrophoresis using *Xba*I. A case-control study was performed to determine risk factors for acquisition of the outbreak clone (clone A); cases were infants infected or colonized with clone A and controls (3 per case) were infants with negative surveillance cultures. During the study period, 19 case-infants, of whom 13 were detected by surveillance cultures, harbored clone A. The overall attack rate for the outbreak strain was 45%; 9 of 19 infants presented with invasive disease (n=6) or developed invasive disease (n=3) after colonization was detected. Clone A was found on the hands of two HCP, one of whom wore artificial nails, and on the designated stethoscope of a case-infant. **Analysis revealed that length of stay per day and exposure to the health-care worker wearing artificial fingernails were associated with infection or colonization with clone A. As a result of this investigation, an institution-wide ban on the wearing of artificial nails was implemented and the authors concluded that short, well-groomed, natural nails should be mandatory for HCP with direct patient contact.**



DIS Comment: In this study, the acquisition of the outbreak strain was significantly associated with exposure to a nurse wearing artificial nails. This is not the first time that artificial fingernails or extenders have been epidemiologically implicated in health-care-associated infections. Multiple outbreaks involving fungal and bacterial infections in hospital intensive-care units and operating rooms have been reported.¹⁻⁵ Keeping nails short is considered key because the majority of flora on the hands are found under and around the fingernails.⁶ Hand carriage of gram-negative organisms has been determined to be greater among wearers of artificial nails than among nonwearers, both before and after handwashing.⁷⁻¹⁰ Fingernails should be short enough to allow dental health-care personnel (DHCP) to thoroughly clean underneath them and prevent glove tears.^{11,12} Sharp nail edges or broken nails are also likely to increase glove failure and long artificial or natural nails can make donning gloves more difficult and can cause gloves to tear more readily.

References

1. Passaro DJ, Waring L, Armstrong R, et al. Postoperative *Serratia marcescens* wound infections traced to an out-of-hospital source. J Infect Dis 1997;175:992–995.
2. Foca M, Jakob K, Whittier S, et al. Endemic *Pseudomonas aeruginosa* infection in a neonatal intensive care unit. N Engl J Med 2000;343:695–700.
3. Moolenaar RL, Crutcher M, San Joaquin VH, et al. A prolonged outbreak of *Pseudomonas aeruginosa* in a neonatal intensive care unit: did staff fingernails play a role in disease transmission? Infect Control Hosp Epidemiol 2000;21:80–85.
4. Parry MF, Grant B, Yukna M, et al. *Candida* osteomyelitis and diskitis after spinal surgery: an outbreak that implicates artificial nail use. Clin Infect Dis 2001;32:352–357.
5. Winslow EH, Jacobson AF. Can a fashion statement harm the patient? Am J Nurs 2000;100:63–65.
6. McGinley KJ, Larson EL, Leyden JJ. Composition and density of microflora in the subungual space of the hand. J Clin Microbiol 1988;26:950–953.
7. Pottinger J, Burns S, Manske C. Bacterial carriage by artificial versus natural nails. Am J Infect Control 1989;17:340–344.
8. McNeil SA, Foster CL, Hedderwick SA, Kauffman CA. Effect of hand cleansing with antimicrobial soap or alcohol-based gel on microbial colonization of artificial fingernails worn by health care workers. Clin Infect Dis 2001;32:367–372.
9. Rubin DM. Prosthetic fingernails in the OR: a research study. AORN J 1988;47:944–945.
10. Hedderwick SA, McNeil SA, Lyons MJ, Kauffman CA. Pathogenic organisms associated with artificial fingernails worn by healthcare workers. Infect Control Hosp Epidemiol 2000;21:505–509.
11. Larson EL. APIC guideline for hand washing and hand antisepsis in health-care settings. Am J Infect Control 1995;23:251–269.
12. CDC. Guidelines for infection control in dental health-care settings – 2003. MMWR 2003; 52(No. RR-17):1–66.