

Shigellosis in the Nursery

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Shigellosis is in the news. With an increasing proportion of preschool children in out-of-home care, we can expect more and more frequent outbreaks of shigellosis. Given the lack of ordinary personal hygiene in toddlers and the small number of bacteria required to transmit *Shigella*, we are indeed fortunate that *Shigella sonnei* is the most common cause of shigellosis in North America, rather than more virulent species such as *Shigella dysenteriae* or *Shigella flexneri*. The article "Shigellosis Occurring in Newborn Nursery Staff" by Beers et al (pp 147-149) documents an outbreak of shigellosis in a newborn nursery. This report is remarkable not so much for describing such an unusual event as shigellosis in a nursery, but for documenting the success of the infection control program in limiting the extent of the outbreak. In spite of the contagiousness of *Shigella*, no secondary cases occurred in infants or mothers exposed to the index case and the infant's mother. The lack of transmission to exposed newborns is in marked contrast to the experience in the index case's family: all six family members had fever and diarrhea in the period preceding the infant's birth, and *S sonnei* was recovered from two of the siblings who were still symptomatic after onset of illness in the index case.

There are many lessons to be learned from the report of this outbreak.

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1. It is important to obtain a history of recent, acute illness in pregnant women. The obstetrical nurses routinely asked mothers about diarrheal disease and, presumably, other acute illnesses occurring before delivery.

2. Mothers should be taught proper handwashing technique. On learning of the mother's episode of diarrhea, she was instructed by the nurses as to the importance of meticulous handwashing.

3. It is crucial that laboratory personnel report unusual isolates to the infection control team immediately. The bacteriology laboratory was aware of the significance of identifying *Shigella* in the stool of a newborn infant and of the need to report this result to infection control, even on a Friday afternoon.

4. Enteric isolation should be instituted at the onset of diarrheal disease. Unfortunately, no mention is made either of the management of the mother, who apparently continued to have diarrhea following delivery, or of the infant at the time of onset of fever and watery diarrhea at one-and-a-half days of age. Enteric isolation should have been instituted on admission of the mother and following birth of the infant, pending identification of the cause of diarrhea.

5. Case-finding and surveillance systems were established immediately.

- a. All nursery staff who had contact with the index case were reached directly or by telephone **on the same afternoon** that *Shigella* was recognized. Those with symptoms of acute diarrhea were excluded from work until stool cultures had been submitted. All stool-positive individuals were excluded from direct patient

contact until antibiotic treatment had eradicated the *Shigella*.

b. The employee health and infection control offices were identified as reporting points for the staff.

c. All mothers and infants who had been on the unit while the index case was in the hospital were contacted by telephone or mail, informed of the problem, and advised to report to their physician if any symptoms developed.

d. All stools from newborns submitted for any purpose were screened for *Shigella* for one month after the onset of disease in the index case.

6. The local health department was notified to investigate the family outbreak.

No cases of diarrheal disease were detected in the 32 infants and mothers who had been in the hospital at the same time as the index case. Given the contagiousness of *Shigella* and the increased susceptibility of newborn infants to infection with most enteric pathogens, the lack of secondary cases in the infants is noteworthy, especially when compared with the high rate of spread among children, not only in day-care but also in primary schools. One important difference between young infants and toddlers may have contributed to the lack of disease in other newborn contacts: the lack of mobility of newborns compared with toddlers. Because they are not ambulatory, the contagiousness of young infants depends on transmission via the hands of their caretakers, whereas the toddler is self-sufficient in disseminating his or her pathogens. The lack of secondary cases among the infants was probably a major factor in limiting the outbreak, as a reservoir of infected infants serving as a source of exposure of staff and mothers did not develop.

Additional factors that may have contributed to the lack of spread to other infants include good handwashing technique by the nursery nurses; prompt and thorough investigation of the outbreak; institution of effective infection control methods; and the relatively short duration of stay of healthy, full-term newborns, which limited their risk of exposure.

However, the infection did spread to some of the nursery staff. Six of 32 staff members who had contact with the mother or infant reported gastrointestinal symptoms in the immediate follow-up period. Three of the six had *S sonnei* isolated from stool cultures. The other three symptomatic staff members and the 23 asymptomatic staff members who submitted stool samples were negative for *Shigella*. It is of interest that all three infected nurses were chronic nail biters. The significance of fingernail biting as a risk factor for acquisition of enteric disease could have

been evaluated in this study by comparing the incidence of shigellosis in nail-biting staff versus non-nail biters. All three nurses with *Shigella* also had histories of prior gastrointestinal problems: two had had gastric stapling and the other had chronic irritable bowel syndrome.

Good luck had some role in limiting the extent of this outbreak. Contrary to the planned control program, one of the infected nurses continued to work while symptomatic until *Shigella* was identified in her stool. This behavior, unfortunately, is all too common. Poor compliance with the general infection control policy of not working when contagious is the result of the lack of adequate paid sick time combined with pressure against taking sick leave because of staff shortages.

Handwashing remains the cornerstone of nosocomial infection control, especially nosocomial diarrhea. Although Beers et al mention both handwashing and the use of gloves as critical components of infection control policy, it must be recognized that there are no studies that address the use, let alone the effectiveness, of gloves in the prevention of nosocomial diarrhea. It is necessary to stress the lack of any documented benefit of glove use compared with handwashing as a "critical component" in the control of nosocomial diarrhea because of the unfortunately common and inappropriate response to the initial version of the universal precautions policy from the Centers for Disease Control.¹ Because the initial version of universal precautions included stool as a body substance, requiring the use of gloves as a protective barrier, many day-care centers are wasting large amounts of money buying gloves for their staff. In the revised recommendations on universal precautions by the Centers for Disease Control, gloves are not recommended for protection against exposure to stool, eg, during routine diaper changing.² Whether the use of gloves in caring for infants with infective diarrhea would reduce nosocomial diarrhea remains to be determined by properly designed clinical trials.

The use of gloves will not solve the problem created by our chronic lack of success in changing the behavior of health care workers and others who care for children. We have yet to find the way to convince those who care for young children that the single most important way of preventing the spread of infection is proper handwashing.

REFERENCES

1. Centers for Disease Control: Recommendation for prevention of HIV transmission in health-care settings. *MMWR* 1987; 36(suppl 2s):1s-18s.
2. Centers for Disease Control: Update: Universal precautions for prevention of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health-care settings. *MMWR* 1988; 37:377-388.