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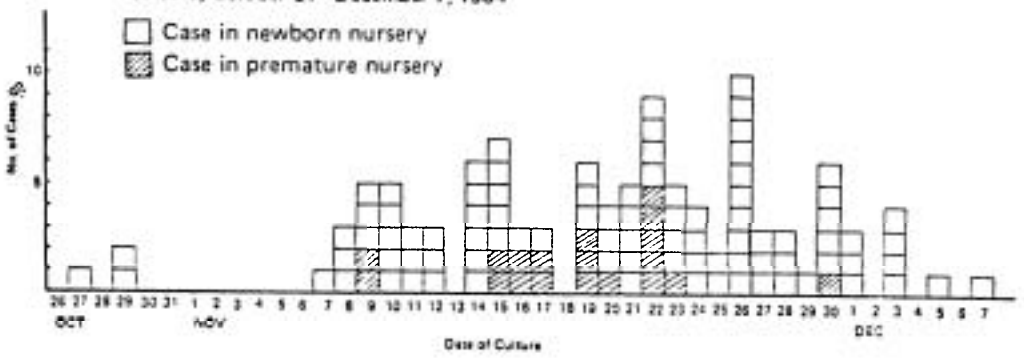
– Contents –

Nursery Epidemic of *Salmonella cerro* in a Taipei Hospital

On November 28, 1984, the Bureau of Medical Affairs received a report of an outbreak of diarrhea among infants in the newborn and premature nurseries of a Taipei hospital. During the period October 27-December 7, 1984, a total of 109 infants with stool cultures positive for *Salmonella* were identified by the hospital's microbiology laboratory (Figure 1). Cases fi t occurred in the newborn nursery on the 5th floor and spread to the premature nursery on the 9th floor after infected infants were transferred for isolation. The attack rates for the newborn and premature nurseries were 90/1207 (7.5%) and 19/34 (55.9%) respectively. Eighty-eight percent of cases had diarrhea and 20% had fever. Four cases developed bacteremia. All cases responded to antibiotic and supportive therapy; there were no deaths. A case-control study showed that prematurity ($p<0.05$) and increased length of hsopitalization ($p<0.05$) were significant risk factors for infection. A stool culture survey of 288 hospital personnel identified 2 nursing students working in the premature nursery, who were positive for the epidemic strain of *Salmonella*. Two of four mothers of the first cases were cultured and found to be negative. The other two mothers could not be located for culture. Isolates from three cases were sent to the U.S. Centers for Disease Control for confirmation and were identified as *Salmonella cerro*. Despite multiple attempts to control the outbreak by the hospital, new cases continued to occur until infected infants and their cohort contacts were physically separated from new admissions to the nurseries.

Fig 1 Cases of *Salmonella cerro* infections among infants in a Taipei Hospital, by date of culture, October 27~December 7, 1984



Reported by National Institute of Preventive Medicine and Bureau of Medical Affairs, Department of Health, the Executive Yuan.

Editorial note: Similar outbreaks of nursery salmonellosis have been reported with relatively high attack rates, especially among premature infants.[1,2] *Salmonella* outbreaks outside the hospital are usually attributable to a contaminated food source. In contrast, outbreaks within hospital nurseries usually begin with the introduction of the organism by a parturient mother and rapid spread from infant-to-infant by hands of personnel and contaminated fomites. Although a culture-positive, community-infected mother was not identified in this outbreak, this was probably how the organism was introduced into the nursery. Since the two culture positive nursing students worked on the 9th floor and the epidemic began on the 5th floor, it is unlikely that either introduced *Salmonella* into the nursery.

Salmonella cerro is an unusual cause of diarrhea in nurseries in Taiwan. In a recent 5-year survey of 273 *Salmonella* cases in newborns and infants admitted to one hospital in Taiwan, none were reported to have this type.[3] In the U.S., *S. cerro* is a commonly isolated serotype and is often present in animal feed and sewage.

An important clinical characteristic of nursery salmonellosis is that convalescent carriage often persists longer in infants than in adults. Asymptomatic carriage for more than 6 months has been observed in over 50 percent of infants in previously studied epidemics.[4] This results in continued dissemination of infection after discharge from the hospital, creating a potential focus of disease in the family and community. Thus in a nursery epidemic, families of discharged infants should be instructed in handwashing and good hygienic practices. Antibiotic therapy in infected infants, as in adults, should be used with care; mature infants with mild gastrointestinal symptoms or low grade fever, or those detected as asymptomatic carriers should not be routinely treated. Antibiotics have been shown to have little effect on the clinical course of non-complicated *Salmonella* gastroenteritis. In addition, antibiotic use has been shown to significantly prolong the duration of intestinal carriage,[5] thus increasing the epidemiologic hazard

to family and community Premature infants or those with systemic illness, however, should receive antibiotic therapy

The following recommendations should be followed in outbreaks of any diarrheal illness in hospital nurseries:

1. The nursery or affected part of the nursery should be closed to further admissions.
2. All infected infants and their cohort contacts must be physically separated from the rest of the nursery.
3. Any personnel who have had contact with infected infants or their cohort contacts should not care for uninfected infants until the outbreak is defined and controlled, and they have been proven culture-negative for the causitive organism. These personnel may, however, continue to care for cases. They should not be assigned to other hospital areas until they have been proven culture negative.
4. Well, mature, uninfected infants should be discharged from the hospital as soon as possible.
5. All nursery personnel, post-partum mothers, and infants should be examined for evidence of any illness, particularly enteric.
6. Handwashing before and after every infant contact should be strongly re-emphasized to all hospital personnel.
7. An epidemiologic investigation should be carried out to determine the source of infection and transmission factors responsible for the outbreak.
8. Environmental and surveillance cultures of the nursery population should be done as indicated by the epidemiologic investigation.
9. After the discharge of all infected infants and their cohort contacts, a thorough cleaning and disinfection of the involved nursery should performed.

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