

CHICK-ASSOCIATED* SALMONELLOSIS

APRIL 11 WILL BE the first Sunday after the first full moon after the vernal equinox — known in the West as Easter. Although many youngsters celebrate with egg hunts and baskets full of candy, the Easter bunny sometimes brings live chicks — cute, fuzzy, and loaded with *Salmonella*. This issue of the *CD Summary* highlights the recurrent problem of salmonellosis from handling chicks.

CONNECTICUT, MARYLAND AND PENNSYLVANIA 1991¹

On April 18, 1991, a local health department notified the Maryland Department of Health and Mental Hygiene of three cases of *Salmonella* serotype Hadar infection linked to ducklings from one pet store. State health departments in Connecticut and Pennsylvania independently identified cases of *S. Hadar* infection among persons who had recently obtained ducklings. In all, the three states identified 22 cases of *S. Hadar* infection during April 1–May 15. Sixteen (73%) were associated with ducklings. Of the 15 duckling-associated cases for whom demographics were known, ages ranged from 3 months to 42 (mean, 7.5) years; 13 were <10 years old. Four were hospitalized. Symptomatic patients had acquired one or more pet ducklings 3–19 days (median: 8 days) before onset of *S. Hadar* infection. In all homes, ducklings were initially kept inside; in at least three, they were allowed to run free. In one home, a duckling lived in the bathtub where children bathed. In another, the mother of a 3-month-old, breastfed infant with *S. Hadar* infection reported not washing her hands after handling ducklings.

A case-control study of children aged ≤10 years was conducted in Maryland and Connecticut. Nine kids with *S. Hadar* infection were compared with 19 age-matched kids with salmonellosis caused by other serotypes. All the children with *S. Hadar* infection lived in a household where a pet duckling was kept; none of

the 19 control kids did ($P<0.01$). Exposures to other pets, farm animals, or undercooked eggs or meat were unassociated with *S. Hadar* infection.

S. Hadar was recovered from 17 of 21 ducklings from lots supplied to the pet store implicated in Maryland and from cloacal swabs or fecal specimens of eight of 13 ducklings associated with the Connecticut and Pennsylvania cases. Ducklings associated with Maryland cases had been obtained from the implicated pet store or had been won as prizes at an Easter egg hunt.

IDAHO AND WASHINGTON, 1995 AND 1996²

During April 1–May 31, 1995, the public health laboratories of the Idaho Department of Health and Welfare (IDHW) and the Washington Department of Health (WDH) identified three and nine *Salmonella* Montevideo isolates, respectively, compared with yearly averages of less than 1 and 20 during 1984–1994. Washington saw another cluster in the same two months of the following year with 11 *S. Montevideo* isolates reported.

For this investigation, the 23 *S. Montevideo* cases during April and May of the two years were analyzed together. Of the 23 cases, 12 were ≤2 years of age, and 5 were ≤6 months of age. One child was bacteremic. Three cases were hospitalized.

To identify exposures associated with illness, IDHW and WDH conducted a case-control study in 1995 and 1996. Illness was strongly associated with chick exposure in the week before onset (matched OR=29; 95% CI= 5–1243). The chicks associated with the 17 cases who reported such exposure were purchased in at least four different counties in 1995 and at least six in 1996. No common hatchery, place of purchase, or feed source was identified. *S. Montevideo* was cultured from 2 chicks associated with 2 geographically separated cases. By mo-

lecular subtyping, the 1995 isolates were indistinguishable. The 1996 isolates were indistinguishable among themselves, but differed from the 1995 bugs.

Isolates from the seven Washington cases who had chick exposure in 1995, from the seven Washington cases who had chick exposure in 1996, and from the two culture-positive chicks were subtyped by pulsed-field gel electrophoresis (PFGE). The patterns differed in 1995 and 1996. However, for the 1995 isolates, the patterns from five isolates were indistinguishable, and for the 1996 isolates, the patterns from five of the human isolates and the two chick isolates were indistinguishable.

OREGON, 1996²

Sixteen *S. Montevideo* cases were reported in Oregon during April–June 1996, compared with a yearly average of 9 cases for 1984–1995. The median age of the 1996 cases was 32 years (range, 5 months–81 years); 3 were ≤2 years old, and 2 were ≤6 months old. Two of the 16 cases were hospitalized.

We conducted a case-control study comparing the Montevideo cases with contemporary salmonellosis cases from the same counties who were infected with other *Salmonella* serotype infections. Again, infection with Montevideo was strongly associated with chick exposure (OR=31.5; 95% CI=2.5–1494). *S. Montevideo* was isolated from two chicks at one case household. No common hatchery, place of purchase, or feed source was identified among poultry associated with the cases.

Among the five *S. Montevideo* patient isolates available, two PFGE patterns were identified. The pattern for four of these isolates and the two chick isolates were indistinguishable; they also matched the pattern seen in Washington that year. The two culture-positive chicks in Oregon came from the same hatchery as one of the culture-positive Washington chicks.

* Non-human, that is.



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MICHIGAN, 1999³

In May 1999, Michigan investigated an increase in *Salmonella* Infantis infections with closely related PFGE patterns; 21 cases were reported with onset of illness during April 1–July 31, 1999. Overall, 17 (81%) of these patients reported exposure to young fowl: eight with chicks, two with ducklings, one with pheasant, and six with multiple species, including chicks and ducklings. Of the young fowl that were traceable, 88% were shipped from a single hatchery.

During the five days before onset, 14 (74%) of 19 patients had direct contact with young fowl or resided in a household that raised fowl, compared with six (16%) of 37 controls (matched OR=20; 95% CI=3–378). In several households, young birds were kept inside the home. One child kept young birds in his bedroom, and another carried chicks inside his jacket.

S. Infantis with the outbreak PFGE pattern was recovered from three of 47 environmental samples and five of 33 bird samples collected at the hatchery in September. Other *Salmonella* serotypes also were isolated from the environmental samples, including Montevideo (7 isolates), Chester (1), and Mbandaka (1).[†]

MISSOURI, 1999³

In April 1999, the Missouri Department of Health (MDOH) noted a cluster of *Salmonella* serotype Typhimurium infections with an identical PFGE pattern. Forty cases were identified with onset of illness during April 4–May 30, 1999; 32 (80%) of these reported exposure to young fowl: 18 to chicks, 10 to

ducklings, three to both chicks and ducklings, and one to a young turkey.

MDOH conducted a case-control study of persons exposed to chicks or ducklings to identify specific behaviors associated with illness. Twenty cases were enrolled; 40 controls who had been exposed to chicks and ducklings during the same time were identified through media advertisements and word of mouth. During the four weeks before onset of patient illness, chicks or ducklings that were identified as ill by the patient or handler were associated with human illness (OR=21; 95% CI=2–508); handwashing after handling fowl was protective against illness (OR=0; 95% CI=0–0.2).

OREGON, 2000, 2002, 2003

Clusters of *Salmonella* Montevideo infections have regularly cropped up during springtime in Oregon and been associated with exposure to chicks. In 2000, 10 cases were identified; in 2002, 9 cases; in 2003, 5 cases. Children ≤5 years of age have accounted for 45% of chick-associated cases.

RUMINATIONS

The cases identified here are almost certainly the tip of a much larger iceberg: it is estimated that only a small fraction (maybe 0.5–3%) of *Salmonella* infections are reported.⁴ Moreover, outbreaks like these are recognized and investigated only when cases of a given serotype cluster in time and space in numbers high enough to attract notice.

Salmonellosis acquired from chicks and ducklings is obviously a recurrent problem. This is not surprising, since these cute little birds appear to be popular among families with young children

around Easter time, and they can be shipped to your door for a couple of bucks a bird. However, like many animals, young fowl are commonly colonized with *Salmonella*, and the young children that cuddle them may not wash their hands afterwards as consistently as we would like. We advise that families with young children avoid adopting baby chicks, ducklings, goslings, pheasants, or turkeys. And don't even ask about turtles, iguanas, and others of their poikilothermic ilk.

Symptoms of *Salmonella* infection usually begin 1–5 days after exposure and include diarrhea, fever, and abdominal cramps. Consider a diagnosis of salmonellosis and asking about chick exposure in kids with diarrhea in the coming weeks. Remember that most salmonellosis resolves in 4–7 days without treatment. Treatment of *Salmonella* enteritis does not reduce the duration of symptoms and can actually prolong fecal shedding of the organism.^{4,5}

REFERENCES

1. CDC. *Salmonella* hadar associated with pet ducklings—Connecticut, Maryland, and Pennsylvania, 1991. MMWR 41:185–7. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00016299.htm>.
2. CDC. *Salmonella* serotype Montevideo infections associated with chicks—Idaho, Washington, and Oregon, spring 1995 and 1996. MMWR 1997; 46:237–9. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/00046940.htm>.
3. CDC. Salmonellosis associated with chicks and ducklings—Michigan and Missouri, Spring 1999. MMWR 2000;49:297–9. Available at <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4914a1.htm>.
4. Sánchez C, García-Restoy E, Garau J, et al. Ciprofloxacin and trimethoprim-sulfamethoxazole versus placebo in acute uncomplicated *Salmonella* enteritis: a double-blind trial. J Infect Dis 1993; 168:1304–7.
5. Nelson JD, Kusmiesz H, Jackson LH, Woodman E. Treatment of *Salmonella* gastroenteritis with ampicillin, amoxicillin, or placebo. Pediatrics 1980;65:1125–30.

[†] Ed. note—sounds like they were feeding them alfalfa sprouts!