Restaurant-Associated Outbreak of Typhoid Fever Traced to a Chronic Carrier

Colorado, 2015

Kerri Brown, MSPH
Outbreak Epidemiologist
Colorado Department of Public Health and Environment
Objectives

• Describe the clinical and epidemiologic characteristics of Typhoid Fever.

• Describe the public health investigation of an outbreak of Typhoid Fever that occurred in Colorado in 2015 involving a retail food establishment.

• Describe the public health interventions and control measures implemented during the outbreak investigation.
The Call — Typhoid Fever

One Typhoid fever case reported. Symptom onset September 2
Salmonella Typhi

- Symptoms — fever, headache, constipation, myalgia, and malaise
- Humans only reservoir
- Transmission is fecal-oral
- Incubation period 3–60 days (range 8–14 days)
- Chronic carriage in 2%–5% of cases
- Shedding can be intermittent
**Epidemiology**

- S. Typhi is endemic worldwide, not in the U.S.
  - Approximately 22 million cases and 200,000 deaths
- In the U.S. about 5,700 cases annually.
- During 2009-2014 Colorado had on average of 6 cases annually.
2nd Case reported - Typhoid Fever

Single case of typhoid fever reported. Symptom onset 9/2

Second case reported. Symptom onset 9/20

9/11 10/1
Colorado

Weld County
Population (2013) 269,785
Typhoid Fever-Investigation

- Started investigation out of concern for a larger outbreak.
- Look for common exposures.
- Stop transmission.
Salmonella Typhi Case Definitions

Case
• Clinically compatible illness
• Isolation of S. Typhi during July 1–October 15
• With 1 of 2 outbreak pulsed-field gel electrophoresis (PFGE) patterns.

Carrier
• Contact with cases
• No recent illness (within 3 months)
• S. Typhi isolated with 1 of 2 outbreak PFGE patterns
Determine Common Exposures

(n = 2)

Exposure Investigation

Questionnaires

Food recall

Credit card receipts

Shopper card records

Social media
Determine Common Exposures

(n = 2)

Exposure Investigation
Questionnaires
Food recall
Credit card receipts
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Social media

Common Exposures
Same groceries stores
Fresh produce
6 restaurants
No common social events
Health Alert Notification (HAN) Issued - Typhoid Fever

One Typhoid Fever case reported. Symptom onset September 2
Second case reported. Symptom onset September 20

HAN issued

September–October 2015
3rd Case Reported — Typhoid Fever

One Typhoid fever case reported.
Symptom onset: September 2

Second case reported.
Symptom onset: September 20

HAN issued

Third case reported.
Symptom onset: September 15

September–October 2015

9/11 10/1 10/13 10/19
Common Exposures

- Patient 3 lived less than 20 miles from patients 1 and 2

- Investigated possible common exposures:
  - No common restaurants, grocery stores or social exposures

- Only shared a single restaurant exposure.....
Patients only shared a single restaurant exposure.
Investigation

- Investigated possible transmission routes using:
  - Environmental assessments
  - Staff interviews
  - Laboratory testing
Staff Interviews and Specimen Testing

- Restaurant A provided employee list, August 10–August 20

- Interviewed current employees

- Employees requested to obtain 2 rectal swab specimens 5 days apart
Carrier Identified — Typhoid Fever

- One Typhoid fever case reported. Symptom onset September 2
- Second case reported. Symptom onset September 20
- HAN issued
- Third case reported. Symptom onset September 15
- S. Typhi isolated from 1 food-worker’s rectal swab

September–October 2015
Restaurant A Investigation Results

- All 28 employees responded and provided ≥1 rectal swab specimen
- S. Typhi was isolated from one food-worker’s rectal swab
- Traveled to an endemic country in year 2000
- No symptoms
Recommendations—Food-worker Infected with S. Typhi

• Treated with azithromycin for 28 days
• Excluded from food service work until 3 negative stools
• Monitored with stool culture until three consecutive specimens obtained ≥1 month apart were negative for S. Typhi
Conclusions

• Chronic S. Typhi carriers can cause illness years after infection.
• Rapid and thorough investigation essential to identify source.
• Good collaboration and communication with local partners is essential.