

CR

CASE REPORT

E. P. C. M. S.

Typhoid Fever: A Rare Occurrence in El Paso

Rene Joukhadar, M.D., PGY-2

Armando D. Meza, M.D.

Texas Tech University H.S.C.

BACKGROUND INFORMATION

Typhoid fever is a severe systemic illness characterized by sustained fever and abdominal symptoms. The disease is caused most commonly by *Salmonella typhi*, and also by *Salmonella paratyphi* A, B, or C. The bacteria are usually contracted by ingestion of contaminated food or water. Complications of this illness may be life threatening as by the third week of infection untreated individuals are at risk of intestinal bleeding and perforation. The mortality rates are high if treatment is delayed or withheld [1]. We report a case of typhoid fever occurring uncommonly in El Paso according to local public health data, although according to the Pan American Health Organization (PAHO), morbidity for typhoid in the U.S. border zone is 60 percent higher than the national rate [2].

CASE PRESENTATION

A 63-year-old man from El Paso, Texas presented in December 2007 with fever, chills and decreased appetite of one week duration. The patient did not report diarrhea until the second day of admission. He had no history of recent or remote travel and does not use public restrooms. The patient drinks bottled water, and eats well cooked food at home. Other household family members were asymptomatic. An extensive review of systems was unremarkable. The physical exam was unremarkable except for the vital signs showing a temperature 104.4 °F and a heart rate of 99 beats/minute. Subsequent temperature and pulse measurements are shown in Figure 1. The laboratory evaluation showed a white blood cell count 5,400; AST 178, ALT 148, ESR 75, CRP 11.5, LDH 608, Hepatitis A IgM negative, Hepatitis C negative, Hepatitis B surface and core antigen non-reactive, monospot test negative, HIV serology negative, serology for paratyphi A, B, typhoid O negative, typhoid H 1:160, fecal leukocytes positive. The blood and stool cultures both grew gram negative rods, later identified as *Salmonella typhi* susceptible to cephalosporins and quinolones. The patient was treated with ceftriaxone during his uncomplicated hospital stay. He was discharged home asymptomatic on oral ciprofloxacin to be reevaluated with a stool culture at a later time to assess if he developed a chronic carrier state that would necessitate further management.

DISCUSSION

This case illustrates the importance of recognizing the clinical clues leading to the diagnosis of certain infectious diseases simply "hidden" in the vital signs. Typhoid fever most commonly caused by *Salmonella Typhi* is uncommon in El Paso; in 2005 and 2006 no cases have been reported [3]. Typhoid fever is uncommon in winter [4,5]. In 2003, approximately three-quarters of

typhoid fever cases occurring in the United States were among persons who reported international travel during the preceding six weeks [6]. In the developed world, the diagnosis is usually considered only in travelers or visitors from endemic areas [7]. Initially, the patient had little in the history and physical exam suggestive of typhoid fever except for the so described relative bradycardia also referred to as pulse-temperature dissociation associated with certain infectious illnesses (Table 1) [8,9,10] which triggered our suspicion of typhoid fever in the presence of diarrhea. Physiologically, for each degree increase in temperature in degrees Fahrenheit, the heart rate should increase by 10 beats/min [10]. If the increase in heart rate is less than expected for a given temperature then relative bradycardia is said to be present provided the following criteria are also met: a) age = 13 years, b) temperature = 102 °F, c) pulse taken simultaneously with the temperature elevation, d) normal sinus rhythm without arrhythmia, e) not taking a β -blocker medication. Our patient fulfilled all criteria for relative bradycardia. Given his measured temperature at different times during the first two days of his hospital stay the expected pulse rate should have been significantly higher than that measured (Figure 1). Relative bradycardia may be due to infectious or non infectious etiologies [9,10] but among the infectious etiologies it is a characteristic feature of typhoid fever with a reported sensitivity of 70% and specificity of 94.7% [8,9,11]. Our decision to place the patient on contact isolation before confirming our diagnosis may have prevented a hospital epidemic where the infection could have spread to other patients sharing the restroom and later to their families.

Typhoid fever is a reportable public health illness. Timely reporting to public health authorities is crucial in order to investigate the source of infection, identify people at risk, and take preventive measures. Hence, not only patient education is important but also public education. Later follow-up is necessary for patients with typhoid fever to assess for chronic, asymptomatic carrier state that requires prolonged antibiotic retreatment and sometimes cholecystectomy [12,13].

REFERENCES

1. Parry CM; Hien TT; Dougan G; White NJ; Farrar JJ. Typhoid fever. *N Engl J Med* 2002 Nov 28;347(22):1770-82.
2. George Kourous, Tina Faulkner, *Community Health in the Borderlands: An Overview*. *BorderLines* 45 (Vol. 6, No. 4, May 1998). <http://americas.irc-online.org/borderlines/1998/bl45/bl45ch.html>
3. *El Paso City-County Health & Environmental District Notifiable Conditions Report 2005 & 2006*.

Continued on page 9

**Typhoid Fever: A Rare Occurrence in El Paso
(Continued)**

4. *Canals M. Seasonal patterns of infectious disease: similarity and differences. Rev Med Chil. 1997 Apr;125(4):403-8.*
5. *Ríos M, García JM, Cubedo M, Pérez D. Time series in the epidemiology of typhoid fever in Spain. Med Clin (Barc). 1996 May 11;106(18):686-9.*
6. *Hopkins, RS, Jajosky, RA, Hall, PA, et al. Summary of notifiable diseases—United States, 2003. MMWR Morb Mortal Wkly Rep 2005; 52:1.*
7. *Yoon, J, Segal-Maurer, S, Rahal, JJ. An Outbreak of Domestically Acquired Typhoid Fever in Queens, NY. Arch Intern Med 2004; 164:565.*
8. *Haq SA, Alam MN, Hossain SM, Ahmed T, Tahir M. Value of clinical features in the diagnosis of enteric fever. Bangladesh Med Res Council Bull. 1997 Aug;23(2):42-6.*
9. *Ostergaard L, Huniche B, Andersen PL. Relative bradycardia in infectious diseases. J Infect. 1996 Nov;33(3):185-91.*
10. *Cunha BA. The diagnostic significance of relative bradycardia in infectious disease. Clin Microbiol Infect. 2000 Dec;6(12):633-4.*
11. *Bo Svenungsson. Typhoid fever in a Swedish hospital for infectious diseases—A 20-year review. Journal of Infection, Volume 5, Issue 2, September 1982, Pages 139-150.*
12. *Zavala Trujillo I, Quiroz C, Gutierrez MA, Arias J, Renteria M. Fluoroquinolones in the treatment of typhoid fever and the carrier state. Eur J Clin Microbiol Infect Dis. 1991 Apr;10(4):334-41.*
13. *Caygill CP, Hill MJ, Braddick M, Sharp JC. Cancer mortality in chronic typhoid and paratyphoid carriers. Lancet. 1994 Jan 8;343(8889):83-4.*

Figure 1

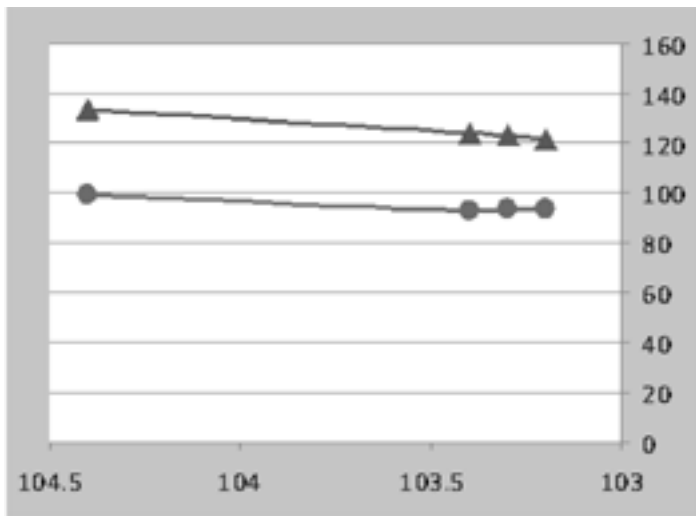


Figure 1 Legend:

The heart rate in beats per minute (vertical axis) is plotted against temperature in °F (horizontal axis). The circles shows four readings of our patient's measured heart rate recorded simultaneously with his temperature, the triangles shows the expected heart rate for this patient given his measured temperature.

Table 1: Infectious diseases commonly associated with relative bradycardia.

Babesiosis
Dengue fever
Legionella
Leptospirosis
Malaria
Psittacosis
Q fever
Rocky Mountain spotted fever
Typhoid fever
Typhus
Viral hemorrhagic fevers
Yellow fever

Rene Joukhadar, M.D., PGY-2, Department of Internal Medicine, Texas Tech University Health Sciences Center, El Paso, Texas.

Armando D. Meza, M.D., Program Director, Assistant Professor, Chief of Infectious Diseases, Department of Internal Medicine, Texas Tech University Health Sciences Center in El Paso, Texas.