world [6]. Municipal authorities in Milan, Italy, walled up houses in which plague victims were discovered, isolating them and their healthy housemates. This practice could not have affected infection transmission via rats and rat fleas, but the Milan death rate was limited to only 15% of the population, the lowest in all of Italy [6].

In summary, the rampant spread of plague within cities and across Europe is not well explained by the traditional model of rats and rat fleas as the primary means of pandemic spread. Historical descriptions, including Coppola's painting, point to a more efficient means of transmission of pandemic plague. The scientific basis for human louse–borne plague has already been demonstrated. Future studies should evaluate the potential role of other arthropods in human-to-human transmission and should substantiate the role human fleas and lice play in plague transmission in infested populations. Through good science and a careful historical study, we will, hopefully, prevent a repeat of the plague's grim history.

Acknowledgments

Potential conflicts of interest. T.J.K. and W.A.A.: no conflicts.

Todd J. Kowalski and William A. Agger

Gundersen Lutheran Health System, Department of Internal Medicine, Section of Infectious Diseases, La Crosse, Wisconsin

References

1. Kiple KF, ed. Plague, pox and pestilence. London: Weidenfeld & Nicolson, **1997**.
2. Houhamdi L, Lepidi H, Drancourt M, Raoult D. Experimental model to evaluate the human body louse as a vector of plague. J Infect Dis **2006**; 194:1589–96.
3. Drancourt M, Houhamdi L, Raoult D. *Yersinia pestis* as a telluric, human ectoparasite–borne organism. Lancet Infect Dis **2006**; 6:234–41.
4. Zinsser H. Rats, lice and history. Boston: Little, Brown, **1935**.
5. Marks G, Beatty WK. Epidemics. New York: Charles Scribner, **1976**.
6. Gottfried RS. The black death: natural and human disaster in medieval Europe. New York: Free Press, **1983**.

Reprints or correspondence: Dr. Todd J. Kowalski, Gundersen Lutheran Health System, Dept. of Internal Medicine, Section of Infectious Diseases, 1836 South Ave., C02-007, La Crosse, WI 54601 (tjkowals@gundluth.org).

Clinical Infectious Diseases 2009; 48:137–8

© 2009 by the Infectious Diseases Society of America. All rights reserved.

1058-4838/2009/4801-0023$15.00
DOI: 10.1086/595557

Necrotizing Fasciitis due to *Listeria monocytogenes*

To the Editor—*Listeria monocytogenes* is an important pathogen in neonates, pregnant women, the elderly population, immunosuppressed individuals, and patients with malignancies, diabetes mellitus, or chronic liver or renal disease [1]. The clinical manifestations of listeriosis include febrile gastroenteritis, CNS infection, and focal infections, such as pneumonia, endocarditis, or joint and bone infections. However, in patients with predisposing conditions and a history of potential exposure, invasive listeriosis should be suspected even in unusual manifestations.

An 82-year-old man presented with weakness and edematous erythema with pronounced tenderness in the left leg. His medical history included chronic edema of the lower extremities, cirrhosis, hypothyroidism, and adrenal insufficiency that was treated with prednisolone (17.5 mg daily) for 2 months. Examination of a blood sample revealed a WBC count of 15,900 cells/mm^3 (with a left shift) and a C-reactive protein level of 218 mg/L (normal level, <5 mg/L). Blood cultures were performed, and a single dose of ceftriaxone was administered (2 g intravenously). Twenty-four hours later, the patient was referred to our hospital because of suspected necrotizing fasciitis. Wide debridement was performed immediately, revealing necrosis within the epidermis and superficial fat layers, as well as severe localized edema. Intravenous antimicrobial treatment was administered (2.2 g of amoxicillin-clavulanate and 600 mg of clindamycin every 8 h and a single dose of gentamicin [5 mg per kg of body weight]). *L. monocytogenes* grew in the blood cultures, and abundant gram-positive, rod-shaped bacteria in the tissue specimens obtained at biopsy were identified as *L. monocytogenes* by culture. When the patient was questioned again, he reported consumption of a large amount of sheep's milk cheese during the period 5–14 days before hospital admission. The treatment was changed to amoxicillin (2 g intravenously every 4 h) and gentamicin (3 mg/kg of body weight daily). The use of aminoglycosides led to a decrease in renal function. Therefore, gentamicin was switched to trimethoprim-sulfamethoxazole (400/80 every 8 h), and the dosage of amoxicillin was reduced. The infection resolved, and antimicrobial treatment was stopped after 15 days.

To our knowledge, this is the first report of listerial necrotizing fasciitis. The clinical entity is clearly different from that of cutaneous listeriosis, which presents as vesicular pustules and usually occurs in veterinarians, farmers, and laboratory workers after direct inoculation [2]. The patient described here did not have contact with animals or a laboratory, nor did he have an obvious skin lesion that could have served as a portal of entry. The consumption of a large amount of unpasteurized sheep's milk cheese was the likely source of bacteremia in a patient with several risk factors (i.e., older age, cirrhosis, and corticosteroid therapy) [1]. The incubation period for invasive listeriosis after ingestion ranges from 11 to 70 days but may be shorter in immunosuppressed individuals [1, 3].

Skin regions affected by lymphedema are strongly associated with recurrent infections [4]. These lymphatic tissue alterations may lead to locally impaired immune responses and insufficient bacterial clearance [5]. Therefore, we postulate that *L. monocytogenes* was seeding in the patient's leg. The involvement of another microorganism is unlikely, because no gram-positive cocci were detected in tissue specimens and no additional bacteria grew in cultures of biopsy specimens. In streptococcal necrotizing fasciitis, examination

source: https://doi.org/10.7892/boris.31451 | downloaded: 23.4.2024

of tissue specimens reveals a high bacterial load for a prolonged period despite the use of intravenous antibiotics [6, 7].

This case illustrates the importance of advising immunocompromised individuals about current food precautions to reduce the risk of invasive listeriosis, as recommended by the Food Safety and Inspection Service [8] and the Centers for Disease Control and Prevention [9].

Acknowledgments

We thank Charlotte Burkhardt for excellent secretarial work.

Potential conflicts of interest. All authors: no conflicts.

Parham Sendi,[1] Elizabeth Marti,[2] Simone Fröhlicher,[4] Mihai A. Constantinescu,[3] and Stefan Zimmerli[1,4]

[1]Clinic for Infectious Diseases, [2]Department of Internal Medicine, and [3]Department of Plastic & Hand Surgery, University Hospital Bern, and [4]Institute for Infectious Diseases, University of Bern, Bern, Switzerland

References

1. Schuchat A, Deaver KA, Wenger JD, et al. Role of foods in sporadic listeriosis. I. Case-control study of dietary risk factors. The Listeria Study Group. JAMA **1992**; 267:2041–5.
2. Cain DB, McCann VL. An unusual case of cutaneous listeriosis. J Clin Microbiol **1986**; 23: 976–7.
3. Siegman-Igra Y, Levin R, Weinberger M, et al. *Listeria monocytogenes* infection in Israel and review of cases worldwide. Emerg Infect Dis **2002**; 8:305–10.
4. Cox NH. Oedema as a risk factor for multiple episodes of cellulitis/erysipelas of the lower leg: a series with community follow-up. Br J Dermatol **2006**; 155:947–50.
5. Sendi P, Graber P, Johansson L, Norrby-Teglund A, Zimmerli W. *Streptococcus agalactiae* in relapsing cellulitis. Clin Infect Dis **2007**; 44: 1141–2.
6. Thulin P, Johansson L, Low DE, et al. Viable group A streptococci in macrophages during acute soft tissue infection. PLoS Med **2006**; 3: e53.
7. Johansson L, Thulin P, Sendi P, et al. Cathelicidin LL-37 in severe *Streptococcus pyogenes* soft tissue infections in humans. Infect Immun **2008**; 76:3399–404.
8. Food Safety and Inspection Service. Listeriosis food safety messages and delivery mechanisms for pregnant women. Available at: http://www.fsis.usda.gov/OA/research/lmfocus.pdf. Accessed 24 August 2008.
9. Centers for Disease Control and Prevention. Division of Foodborne, Bacterial, and Mycotic Diseases. Listeriosis. Available at: http://www.cdc.gov/nczved/dfbmd/disease_listing/listeriosis_gi.html. Accessed 24 August 2008.

Reprints or correspondence: Dr. Parham Sendi, Clinic for Infectious Diseases, University Hospital Bern, Bern 3010, Switzerland (sendi-pa@magnet.ch).

Clinical Infectious Diseases 2009; 48:138–9

© 2009 by the Infectious Diseases Society of America. All rights reserved.

1058-4838/2009/4801-0024$15.00
DOI: 10.1086/595558