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Bartonella quintana Endocarditis Following Body Louse Exposure, Anchorage

Background

Bartonella are Gram negative bacteria transmitted by insect vectors.¹ *Bartonella quintana* is transmitted by the human body louse, *Pediculus humanus corporis*. Bacteria multiply in the gut of the louse and are transmitted to humans by louse feces coming in contact with openings in the skin (e.g., through scratching).¹ Clinical complications include bacteremia, bacillary angiomatosis, trench fever, and endocarditis.¹ *B. quintana* bacteremia has been estimated to occur in up to 5% of homeless people who are frequently exposed to body lice,² and *B. quintana* endocarditis is estimated to account for approximately 5% of cases of culture-negative endocarditis.^{3,4} Diagnosis is indicated by *Bartonella* serology titer >1:800 or detection of *B. quintana* in blood or valve tissue by PCR.¹ Treatment includes prolonged antibiotic therapy and, if necessary, surgical valve replacement.¹

Investigation

From January 2012 to July 2014, *Bartonella* endocarditis was diagnosed in several patients hospitalized in Anchorage. In November 2014, the Alaska Section of Epidemiology (SOE) and Arctic Investigations Program (AIP), Centers for Disease Control and Prevention (CDC) initiated an investigation to expand case finding efforts, characterize cases and risk factors for illness, and develop mitigation strategies. A confirmed case was defined as endocarditis in a person with a) *B. quintana* risk factors and *B. quintana* serology titer ≥1:800, or b) confirmation of *B. quintana* on PCR. A probable case was defined as endocarditis in a person with any positive *B. quintana* serology. Cases were identified by infectious diseases physicians and by searching for any admission to a tertiary hospital in Anchorage during 2012–2014 with an ICD-9 discharge code for bartonellosis (088.0) or trench fever (083.1). During this time, six confirmed and one probable case of *B. quintana* endocarditis were identified.

All cases occurred in men aged ≥40 years who presented with valvular insufficiency; two cases presented with febrile illness (Table). Two patients died after poor adherence to therapy; all other patients required valve replacement in addition to antibiotics. Four patients were identified as being homeless and alcoholic. Other patients described either having contact with homeless persons or having worked in waste disposal.

To determine if *B. quintana* is currently present in Alaska lice, over a 6-month period starting in August 2015, a convenience sample of 78 lice were collected from the clothing of 31 patients presenting to an Anchorage emergency department. Lice were then shipped to the CDC Division of Vector Borne Diseases for PCR testing. Four lice from clothing (5% of lice collected) of two patients were positive for *B. quintana* DNA.

Discussion

During 2012–2014, six confirmed cases and one probable case of *B. quintana* endocarditis were identified. Since *B. quintana* infection is challenging to diagnose, prevalent in homeless persons,¹ and only rarely results in endocarditis, this number likely represents a small subset of the prevalent *B. quintana* infections among persons exposed to body lice in the Anchorage area at that time.

While the challenges of screening and early treatment with prolonged and parenteral therapy limit treatment of early infection in high-risk populations (e.g., over 6000 persons are estimated to access emergency shelters each year in Anchorage alone), established strategies exist to eradicate louse infestations.^{1,5} For example, in addition to promptly identifying cases of *B. quintana* endocarditis, treating louse infestation will prevent future infections and sequelae. Louse treatment strategies include:

- showering and changing clothing at least weekly;
- laundering all clothes, bed linens and towels using hot water ≥130°F and a hot dryer cycle; and
- using a pediculicide to kill lice if the aforementioned measures are unsuccessful.

Recommendations

1. Health care providers should consider *B. quintana* endocarditis in any Alaska resident with possible body louse exposure and new valvular insufficiency, and
 - consider an infectious disease physician consultation,
 - perform echocardiogram and blood cultures,
 - send serology for *Bartonella*, and
 - inform the Alaska Section of Epidemiology of suspect or confirmed cases (call: 907-269-8000).
2. Homeless shelters should continue to support louse eradication with high temperature laundry, clean clothes, and insecticide treatment (online resources are available at: <http://dhss.alaska.gov/dph/Epi/id/Pages/dod/lice/>).

References

1. Foucault C, Brouqui P, Raoult D. *Bartonella quintana* characteristics and clinical management. *Emerg Inf Dis* 2006;12(2):217-23.
2. Brouqui P, et al. Ectoparasitism and vector-borne diseases in 930 homeless people from Marseilles. *Medicine* 2005;84(1):61-8.
3. Fournier PE, et al. Comprehensive diagnostic strategy for blood culture-negative endocarditis: a prospective study of 819 new cases. *Clin Infect Dis* 2010;51(2):131-40.
4. Edouard S, et al. Bartonella, A common cause of endocarditis: a report on 106 cases and review. *J Clin Microbiol* 2014;53(3):824-9.
5. Sheltered Homeless Persons in Anchorage: Alaska Coalition on Housing and Homelessness, 2014. Available at: <http://www.alaskahousing-homeless.org/annual-homeless-assistance-report-ahar>

Table. Background, Presentation, Surgery, and Outcome of Patients with *B. quintana* Endocarditis in Anchorage, 2012–2014

Case	Age (years)	Medical Background	Presentation (Valve Affected)	Serology Titer (PCR result)	Surgery (Duration of antibiotics)	Outcome
A	51*	Alcoholism**	Pulmonary edema (aortic)	≥1:1024 (blood PCR positive)	Declined surgery (Limited adherence)	Died
B	57	Well	Cough, fever, (aortic)	≥1:512 (blood PCR negative)	Valve replacement (6 weeks)	Survived
C	40	Well	Congestive cardiac failure, fever (aortic)	Serology negative (valve PCR positive)	Valve replacement (6 weeks)	Survived
D	49*	Alcoholism, Mitral valve defect**	Congestive cardiac failure (mitral)	≥1:512 (blood PCR positive)	Valve replacement (6 weeks)	Survived
E	60*	Alcoholic cardiomyopathy**	Congestive cardiac failure (aortic)	≥1:1024 (blood PCR negative)	Too unstable (Limited adherence)	Died
F	53*	Alcoholism	Congestive cardiac failure (aortic)	≥1:512 (valve PCR positive)	Valve replacement (6 weeks)	Survived
G	67	Obesity	Congestive cardiac failure (aortic)	≥1:1024 (valve PCR positive)	Valve replacement (6 weeks)	Survived

*Patient reported prior homelessness. **Patient reported prior or current louse infestation.