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Acute Q-fever infection in a dairy products maker without direct animal contact: a case report.

Q-fever is a zoonotic infection with manifestations from asymptomatic to fatal endovascular infection.

Transmission from raw milk exposure is controversial and current recommendations don't include precautions or education for these individuals. We present the first reported case of confirmed Q-fever infection in a dairy products maker without animal contact.

Clinical Record

A 38-year-old male Dairy products maker presented to an emergency department with 6-days of fever and myalgia. He lived within Melbourne's inner suburbs and had no recent contact with abattoirs, farms or farm animals. At onset, he experienced chills, rigors, myalgia, lethargy and mild vomiting.

At presentation, he had tachycardia and fever (38.6°C). Examination was otherwise normal. Admission full blood examination showed mild lymphopenia (0.6×10^9 /L) and thrombocytopenia (143×10^9 /L); Liver function tests were mildly deranged in a mixed pattern showing (ALT, 118U/L); (GGT, 217U/L); ALP, 80 U/L); (Bilirubin, 23 μ mol/L); He was started on empiric ceftriaxone for presumed sepsis.

Pre-antibiotic blood cultures were negative as was stool culture. On the 3rd day of admission the patient defervesced and his symptoms improved. Following suggestive *Coxiella burnetii* serological results this was changed to oral doxycycline 100mg BD for 14 days. Direct questioning revealed exposure to sprays of raw cow's milk when unhooking pressurised pipes at a milk processing plant 3 weeks prior to presentation, in addition to general exposure to raw milk and milk trucks. Symptoms had fully resolved within 3 weeks and repeat testing of confluent serum definitively diagnosed acute Q-fever (Table 1).

Discussion

Q-Fever is a vaccine preventable zoonosis caused by the obligate intracellular gram-negative bacteria *Coxiella burnetii*. Infection occurs following inhalation of aerosolised organisms or direct inoculation through skin.

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People with direct close contact with susceptible animals (abattoir workers, veterinarians, farmers) are at greatest risk. Infection is often asymptomatic or acute self-limiting febrile illness. Chronic infection (usually endocarditis or endovascular) can manifest months or years later⁽¹⁾. While treatment of apparent self-limited infection is controversial a recent study in the Netherlands supports the treatment of acute Q-fever to reduce progression to chronic infection⁽²⁾.

Occupational exposure to Q-fever is well described and pre-employment vaccination is recommended in Australia for at-risk professions⁽³⁾. However, it is recognised that this does not account for all Q-fever cases⁽⁴⁾. The significance of unpasteurised milk exposure as a risk factor for Q-fever is controversial. Oral ingestion is a poorer route of infection and milk contains lower numbers of viable organisms than placental tissue⁽⁵⁾. Data is limited but a recent review suggests that unpasteurised milk consumption is a risk⁽⁵⁾. This case provides evidence that those in the milk processing industry may be at risk of infection. Current Australian vaccination recommendations do not include these people as a risk group⁽³⁾. These workers may be at greater risk than those consuming raw milk due to the risk of aerosolisation and inhalation of organisms which may be present in contaminated milk or soil, which is a more infectious route⁽⁵⁾. Our case demonstrates that the risk of Q-fever exposure to industrial milk workers needs further examination so that appropriate education and recommendations can be made to prevent unnecessary morbidity and perhaps mortality.

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Table1. *Coxiella burnettii* serology results tested in parallel showing phase II seroconversion, plus confirmatory result for confluent sample from reference laboratory.

<i>Date specimen collected</i>	Phase II result				Phase I result	
	IgA	IgM	IgG	IgA	IgM	IgG
14/01/2017	N/A	Positive [†]	Not detected [‡]	N/A	N/A	N/A
31/01/2017	N/A	Positive	Positive	N/A	N/A	N/A
31/01/2017 [§]	Not detected	1:1600	1:800	Not detected	1:100	Not detected

[†] Q fever serology (phase 2) IgM was performed using the Vircell *Coxiella burnettii* IgM ELISA (Vircell S.L., Granada, Spain) and performed by Australian Clinical Labs, Adelaide, Australia.

[‡] Q fever serology (phase 2) IgG was performed using the Panbio *Coxiella burnettii* IgG ELISA (Standard Diagnostics Inc., Korea) and performed by Australian Clinical Labs, Adelaide, Australia.

[§] Q fever serology Phase 1 and 2 was performed using immunofluorescence phase I +II for individual IgA and IgG performed by Rickettsial Reference Laboratory, Geelong, Australia.

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Abstract

Q-fever is a zoonotic infection with manifestations from asymptomatic to fatal endovascular infection. Transmission from raw milk exposure is controversial and recommendations don't include precautions or education for individuals with exposure. We present the first reported case of confirmed Q-fever infection in a milk processing worker without animal contact. This may have impacts on clinical care and public health recommendations.

Key words: Q-fever, *Coxiella burnetii*, raw milk,

Acute Q-fever infection in a dairy products maker without direct animal contact: a case report

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