

Acute Q Fever in Pregnancy

Epidemiology, Implications and Management

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Case Details

- 22 year old female, G1P0, 28/40
 - Presented to a rural Qld hospital
 - Unwell for 3 days
 - Fevers to 39°
 - Sweats, myalgias, headaches
 - Nausea and vomiting
 - Moist cough
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Case Details

- PMHx - nil significant
 - Ex-smoker 20 cigs per day
 - No EtOH during pregnancy
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Case Details

□ Clinical examination was unremarkable

□ Blood results

Hb	<u>101</u>	Na	<u>133</u>
WCC	4.0	Alb	<u>32</u>
Nφ	3.2	Bili	10
L φ	<u>0.6</u>	ALT	<u>69</u>
M φ	<u>0.08</u>	AST	<u>83</u>
Plt	<u>98</u>		
MCV	90		

Case Details

- Provisional diagnosis
 - Non-specific viral illness

 - Admitted for IV fluids and anti-emetics

 - Condition improved over a few days and patient discharged
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Case Details

- Single vehicle rollover while driving home

 - No head injury, PV bleeding or abdominal pain

 - Injuries minor –
 - Seatbelt related chest wall bruising
 - Fractured right 1st metacarpal

 - Referred to tertiary centre for obstetric and orthopaedic review
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Case Details

- Foetal USS
 - Healthy foetus
 - No signs of placental abruption

 - Cardiotocography was normal

 - Abnormal blood results already resolving
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Case Details

- Further history –
 - Patient lived out of town
 - Surrounded by grazing animals
 - Partner worked at local piggery
 - Father had a captive wild pig

 - Zoonotic serology ordered
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Q Fever Serology

Ph2 IgG (EIA) Non Reactive

Ph2 IgM (EIA) Reactive

Ph1 IgG (IF) < 10

Ph2 IgG (IF) < 10

Ph2 IgM (IF) 80

Case Details

- Infectious Diseases & Obstetric Medicine consults
 - Literature R/V suggested significant risk of adverse outcome for mother and foetus
 - Cotrimoxazole commenced
 - Fracture managed conservatively
 - Discharged with ongoing follow-up
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Key Questions

1. How prevalent is acute Q fever in pregnancy?
 2. What are the implications for the mother and her foetus?
 3. How should acute Q fever in pregnancy be treated?
 4. What follow-up is required?
 5. Are birthing suite staff and the neonate at risk?
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“Queensland” Fever

- ❑ Zoonotic infection caused by *Coxiella burnetii*
 - ❑ Gram-negative obligate intracellular bacterium - replicates in acidic phagolysosomes
 - ❑ First described by Derrick in 1937
 - ❑ Endemic throughout the world
 - ❑ Results in both acute and chronic infection
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Q Fever

- Acute infection –
 - Asymptomatic or mild, “flu-like” symptoms
 - Non-specific febrile illness
 - Granulomatous hepatitis
 - Pneumonia
 - Myopericarditis
 - Septic shock

 - Chronic infection –
 - Culture negative endocarditis
 - Osteomyelitis
 - Infection of vascular grafts and aneurysms
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Q Fever

- A variety of animals constitute reservoirs of infection

 - Shed in high numbers -
 - urine
 - faeces
 - milk
 - products of conception
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Q Fever

- Transmission -
 - inhalation of contaminated aerosols
 - ingestion of unpasteurised milk

 - Factors influencing clinical expression -
 - strain
 - size of inoculum
 - route of infection
 - host factors
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Q Fever

Host factors

- Immunocompromised state
 - Preexisting valvular heart disease
 - Pregnancy
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Q Fever

- Reproductive outcomes in animals -
 - abortion
 - prematurity
 - low birth weight
 - infertility

 - Placentitis and immune complex formation → placental insufficiency

 - Direct infection of foetal tissues also described
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Q Fever Serology

- Acute infection -
 - Phase II Ab detectable within 1 - 2 weeks
 - Peak between 4 and 12 weeks
 - Recent infection is confirmed by a positive IgM test or a four fold rise in titre
 - Phase I Ab appearance delayed
 - Only significantly raised in chronic infection
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Q Fever Serology

Chronic infection

- Rising or persisting Phase I IgG titre ≥ 800
 - Compatible clinical syndrome
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AHA Guidelines - Endocarditis

TABLE 1B. Definition of Terms Used in the Modified Duke Criteria for the Diagnosis of Infective Endocarditis

Major criteria

Blood culture positive for IE

Typical microorganisms consistent with IE from 2 separate blood cultures: Viridans streptococci, *Streptococcus bovis*, HACEK group, ***Staphylococcus aureus***, or community-acquired enterococci in the absence of a primary focus; or

Microorganisms consistent with IE from persistently positive blood cultures defined as follows: At least 2 positive cultures of blood samples drawn >12 h apart; or all of 3 or a majority of ≥ 4 separate cultures of blood (with first and last sample drawn at least 1 h apart)

Single positive blood culture for *Coxiella burnetii* or anti-phase 1 IgG antibody titer >1:800

Evidence of endocardial involvement

Echocardiogram positive for IE (**TEE recommended for patients with prosthetic valves, rated at least "possible IE" by clinical criteria, or complicated IE [paravalvular abscess]; TTE as first test in other patients**) defined as follows: oscillating intracardiac mass on valve or supporting structures, in the path of regurgitant jets, or on implanted material in the absence of an alternative anatomic explanation; or abscess; or new partial dehiscence of prosthetic valve; new valvular regurgitation (worsening or changing or preexisting murmur not sufficient)

1. Epidemiology

- Bertaud 1953
 - Bull Fed Soc Gynecol Obstet Lang Fr

 - Less than 100 cases reported

 - French National Centre for Rickettsioses responsible for most published work
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1. Epidemiology

- Stein & Raoult CID 1998;27:592-6
 - ≥ 1 in 540 pregnancies in Martigues

 - Tissot-Dupont CID 2007;44:232-7
 - 11 of 379 pregnancies (2.6%) in Chamonix Valley

 - No Australian data
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1. Epidemiology

- Suggests maternal infection under-recognised
 - Diagnosis should be considered in women with a compatible clinical illness and risk factors
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2. What are the implications for the mother and her pregnancy?

- Adverse pregnancy outcomes in 81% of untreated patients
 - Carcopino CID 2007;45:548-55

 - Reported outcomes –

■ Intra-uterine foetal death	27%
■ Premature delivery	27%
■ Intra-uterine growth retardation	27%
■ Spontaneous abortion	13%
■ Oligohydramnios	10%
-

2. What are the implications for the mother and her pregnancy?

Variables correlating with poor outcome –
Carcopino CID 2007;45:548-55

1. Lack of effective treatment -
 - Adverse outcomes in 43% treated v's 81% untreated
 - Adverse outcomes limited to IUGR and premature delivery in the treatment group

 2. Gestational age at infection -
 - Adverse outcomes in 93% infected in 1st trimester v's 30% infected in 2nd or 3rd trimester
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3. How should acute Q fever in pregnancy be treated?

- Therapeutic options limited -
 - effects on foetus
 - bacteriostatic v's bacteriocidal effect

 - Cotrimoxazole safe and effective

 - Recommended until term
 - Carcopino CID 2007;45:548-55
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Cotrimoxazole

- ❑ ↓ frequency and severity of adverse outcomes
 - ❑ ↓ progression to chronic infection
 - ❑ None of those treated developed endocarditis
 - ❑ Concerns re neonatal hyperbilirubinaemia unfounded
 - Forna AIDS Rev. 2006;8:24-36
 - Carcopino CID 2007;45:548-55
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4. What follow-up is required?

- TTE for all (pregnant or not)

 - Risk of endocarditis ~ 40% if abnormal valve morphology

 - Prophylactic treatment with doxycycline and hydroxychloroquine for 12 months
 - Fenollar CID 2001;33:312-16
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4. What follow-up is required?

- Risk of chronic Q fever 50% v's 5% general population
 - Serological followup for a minimum of 24 months
 - Rising or persisting Phase 1 IgG titres ≥ 800
 - TOE
 - Coxiella PCR on serum
 - Endocarditis treatment = doxycycline + hydroxychloroquine at least 18 months
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5. Are birthing suite staff and the neonate at risk?

- Yes - Obstetrician with Q fever pneumonia
 - Raoult & Stein NEJM 1994;330:371

 - Infant also at risk -
 - In-utero
 - amniotic fluid exposure peripartum
 - ? breast milk
-

5. Are birthing suite staff and the neonate at risk?

- Coxiella in human breast milk -
 - Prasad Int J Zoonoses 1986;13:112-7
 - Kumar Indian J Med Res 1981;73:510-2

 - Little is known about the frequency and significance of congenital Q fever

 - All infants born to exposed mothers should therefore be followed up closely
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Case Resolution

- Cotrimoxazole until term
 - TTE normal
 - Delivered a healthy full-term infant
 - Placental tissue PCR positive for Coxiella DNA -
 - breast milk PCR negative
 - amniotic fluid not collected
 - Mother and infant remain well
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Q Fever in Pregnancy - Summary

- Uncommon, but under-recognised
 - Significant risk to both mother and foetus
 - Cotrimoxazole from diagnosis until delivery safe and effective
 - TTE for all patients
 - Serological surveillance for at least 2 years
 - Consider those in birthing suite
 - Advice re potential risk of breast feeding
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Acknowledgements

Dr Marion Woods

Senior Staff Specialist in Infectious Diseases

Royal Brisbane & Women's Hospital

Questions

21st Century Essential NBC Reference Series

BIOLOGICAL WEAPONS

Use of Biological Weapons * The Threat
Anthrax * Plague * Tularemia * Toxins * Ricin * Botulinum
Brucellosis * Q Fever * Smallpox

Excerpted from *MEDICAL ASPECTS OF CHEMICAL AND BIOLOGICAL WARFARE*

ESSENTIAL NBC REFERENCE SERIES: BIOTERRORISM, NUCLEAR, BIOLOGICAL, CHEMICAL, RADIATION AND RADIOLOGICAL TERRORISM, GERM WARFARE, HOMELAND SECURITY, SURVIVAL AND MEDICAL DATA, WEAPONS OF MASS DESTRUCTION (WMD), FIRST RESPONDER

q fever

a worker from cattle plant "d"
earned money by mopping up pee.
one day he fell ill
with horrible chills,
and a fever of one-twenty-three.

