The burden of disease of Q-fever:
a meta-analysis with individual patient data up to nine years after acute infection

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Introduction

- The ***largest Q-fever outbreak*** to date took place in the Netherlands between 2007 and 2010, with over 4000 registered cases.
- Many studies regarding the impact of Q-fever (i.e. quality of life (QoL), fatigue, physical and social functioning) from onset of illness up to 9 years after acute infection were performed.
- However, a ***comprehensive overview***, including short- and long-term impact and comparing different Q-fever patient groups, is lacking.

Objective

To analyse the impact of Q-fever in 3 patient groups: Q-fever fatigue syndrome (QFS), chronic Q-fever, and other (not further specified) Q-fever patients.

Methods

A patient level pooled multilevel analysis was performed on original data from 8 studies.

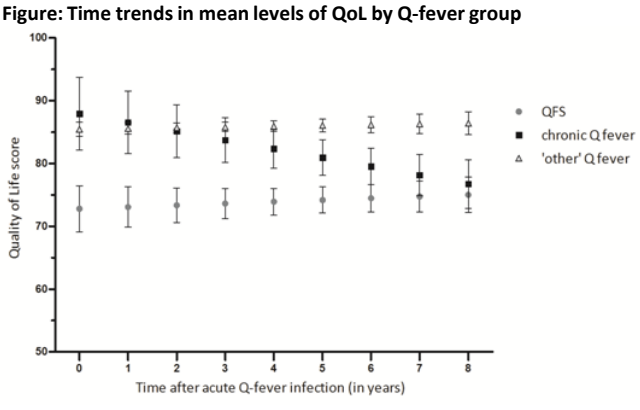
Patient groups

- QFS: Severe debilitating fatigue following Q-fever infection
- Chronic Q-fever: Persistent infection with endocarditis or vascular infection
- Other Q-fever: not further specified

Impact of Q-fever was analysed using data on:

- QoL (Nijmegen Clinical Screening Instrument)
- Fatigue (Checklist Individual Strength)
- Physical impairment (Sickness Impact Profile)
- Social participation (Short Form 36)

Figure: Time trends in mean levels of QoL by Q-fever group



Results

- Data included 3947 observations of 2313 individual Q-fever patients (228 QFS, 135 chronic Q-fever and 1950 other Q-fever patients).
- In the first years following the acute Q-fever infection, impact was ***highest among QFS*** patients, and remained high, with no significant changes over time.
- In ***chronic Q-fever patients***, levels of QoL, fatigue, and physical functioning ***worsened*** significantly over time.
- In contrast, all outcomes among ***other Q-fever patients (86% of patients) improved*** significantly over time.
- Mean impact in patient groups are reported (see table & figure), but within patient groups variation in impact was observed.

Table: Impact on QoL, fatigue, physical impairment and social participation by Q-fever group

		Intercept (95% CI): score at baseline	Slope (95% CI): change per time point
QoL	QFS	72.2 (68.5; 75.9) [a]	0.28 (-0.34; 0.9)
	Chronic Q-fever	87.4 (81.5; 93.3) [b]	-1.40 (-2.37; -0.43)*
	Other Q-fever	84.9 (83.5; 86.3) [b]	0.12 (-0.19; 0.43)
Fatigue	QFS	45.8 (43.3; 48.3) [a]	-0.18 (-0.75; 0.39)
	Chronic Q- fever	35.6 (30.5; 40.8) [b]	0.52 (-0.50; 1,53)
	Other Q-fever	37.1 (35.8; 38.3) [b]	-0.91 (-1.23; -0.59)*
Physical impairment	QFS	13.9 (12.0; 15.8) [a]	0.51 (0.14; 0.87)*
	Chronic Q-fever	12.6 (8.2; 16.9) [a,b]	1.28 (0.54; 2.02)*
	Other Q-fever	8.4 (7.3; 9.4) [b]	-0.06 (-0.32; 0.19)
Social participation	QFS	50.5 (43.1; 57.8) [a]	0.12 (-1.20; 1,40)
	Chronic Q-fever	44.6 (36.1; 53 0) [a]	1.10 (-0.54; 2.80)
	Other Q-fever	68.5 (64.5; 72.5) [b]	5.20 (3.30; 7.20)*

Higher scores mean better QoL/social participation; but more fatigue / physical impairment
*[a b] Different superscripts denote significant group differences. * Significant change (p<.05)*

Conclusion

The impact of Q-fever differs greatly between QFS, chronic Q-fever and other Q-fever patients. Among chronic Q-fever patients, levels of QoL, fatigue and physical functioning continue to worsen over time, while QFS patients report a continued high impact. However, the largest group (other Q-fever), showed significant improvements over time.

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