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Q fever in acute upper respiratory tract infection

Niro OKIMOTO, Yasuhiro KAWAI, Tadashi KATOH, Takeyuki KURIHARA, Naoyuki MIYASHITA, Hiroki HARA

Department of General Internal Medicine 1, Kawasaki Medical School General Medical Center, 2-6-1, Nakasange Kitaku, Okayama, 700-8505, Japan

ABSTRACT We examined whether or not acute upper respiratory tract infection is associated with Q fever (*Coxiella burnetii* infection). The subjects consisted of 124 patients with acute upper respiratory tract infection. At initial medical consultation, the presence or absence of serum *C. burnetii* was examined by nested PCR method. Of the 124 patients, no patients (0 percent) were positive for *C. burnetii* in serum. These results suggested that the involvement of Q fever in acute upper respiratory tract infection is extremely low.

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Key words: Acute upper respiratory tract infection, Q fever, *Coxiella burnetii*

INTRODUCTION

Q fever is zoonosis caused by infection of *Coxiella burnetii*. Pets such as dogs or cats, domestic livestock such as cows, goats, or sheep, and various wild animals are sources for human infection. In infected animals, *C. burnetii* is reactivated during pregnancy and rapidly grows in the placenta. When infected animals deliver their offspring, *C. burnetii* spreads and in humans causes infection following its inhalation. Patients develop atypical pneumonia and chronic fatigue syndrome occur by chronic persistent infection. In this study, the involvement of Q fever in acute upper respiratory tract infection was examined.

SUBJECTS AND METHODS

Subjects

We examined 124 patients (64 males and 60 females, age; 18-75 years old; mean 42) with acute upper respiratory tract infection treated as outpatient at Kawasaki Hospital, Kawasaki Medical School from April 1, 2014 to December 31, 2015.

Acute upper respiratory tract infection was defined as development of fever 37.5℃ or greater and cold symptoms such as pharyngeal pain, headache, nasal discharge, cough, or sputum.

The underlying diseases of subjects were chronic obstructive pulmonary disease in 20 patients, hypertension in 18 patients, diabetes mellitus 10 patients, bronchiectasis in 8 patients, lung cancer in 8 patients, *M. avium* cmplex in 7 patients, idiopathic interstitial pneumonias in 5 patients, other disease in

Corresponding author
Niro Okimoto
Department of General Internal Medicine 1, Kawasaki Medical School General Medical Center, 2-6-1, Nakasange Kitaku, Okayama, 700-8505, Japan
Phone : 81 86 225 2111
Fax : 81 86 224 6555
E-mail: n.okimoto@med.kawasaki-m.ac.jp

20 patients and none in 28 patients.

The physical status of subjects were PS 1 in 101 patients and PS 2 in 23 patients.

Methods

At initial medical consultation, the presence of serum *C. burnetii* was examined by nested PCR method[1]. The primers of this nested PCR was the *com1* gene encoding a 27-kDa outer membrane protein of *C. burnetii*. Positive results of nested PCR were correlated with the serum antibody titers of *C. burnetii*.

This study was conducted after obtaining permission from the ethical committee of our institution.

RESULTS

Of the 124 patients, no patients (0 percent) were positive for *C. burnetii* in serum (Table 1).

Table 1. Detection *Coxiella burnetii* in serum samples by nested PCR assay

— Acute upper respiratory tracts infection —

Subjects		Positive cases
124	⟶	0 (0%)

DISCUSSION

We have reported the involvement of Q fever in 4 (1.4 percent) of 284 patients with community-acquired pneumonia[2], 6 (6.7 percent) of 89 patients with acute exacerbation of bronchial asthma[3], 2 (2.5 percent) of 80 patients with acute exacerbations/infections in chronic lung disease[4], 0 (0 percent) of 121 patients with hospital-acquired pneumonia[5], and 1 (1.1 percent) of 94 patients with prolonged cough[6]. In this study we examined the involvement of Q fever in 124 patients with acute upper respiratory tract infection, and found no patients with *C. burnetii*.

In 1993 Nagaoka *et al.*[7] reported first isolation of the Q fever agent from patients with influenza-like illness in Japan, and Takahashi *et al.*[8] reported that 2 (1.3 percent) of 149 patients with acute upper respiratory tract infection had Q fever. In Greece, Pappas *et al.*[9] reported 2 patients with acute upper respiratory tract infection. While serum antibody value was used for diagnosis in these reports, we employed nested PCR method with serum in the present study. The absence of positive patients may be due to the lower amount of *C. burnetii* in serum in acute upper respiratory tract infection.

Furthermore, we would like to examine nasal or throat swab as specimens.

Considering the results of this study and past reports, it was concluded that the involvement of Q fever in acute upper respiratory tract infection is extremely low.

Conflict of interest: The authors have no conflicts of interest in relation to this article.

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