# Q fever in adults patients with prolonged cough

Niro OKIMOTO, Toshikiyo HAYASHI, Hisataka TANAKA, Michihiro KISHIMOTO
Takeyuki KURIHARA, Norikuni KAWANAKA, Naoyuki MIYASHITA

*Department of General Internal Medicine 1, Kawasaki Hospital, Kawasaki Medical Shool*
*2-1-80 Nakasange, Kitaku, Okayama, 700-8505, Japan*

**ABSTRACT** The involvement of Q fever in prolonged cough (which lasts 3 weeks or longer) was examined. Ninety-four adult patients who visited Kawasaki Hospital,Kawsaki Medical School from April 2007 to March 2011 complaining of prolonged cough whose chest radiographs showed no abnormality were selected as subjects. The diagnosis of Q fever was made using ELISA kit from PanBio. According to the results, Q fever infection was found in 1 (1.1 %) of 94 patients. Q fever may, therefore, be a cause of prolonged cough, though its frequency is low.

*(Accepted on August 8, 2011)*

Key words：**Q fever, *Coxilla burnetii*, Prolonged cough**

## INTRODUCTION

The Japanese Respiratory Society guideline in management of cough[1)] classifies coughs into acute cough, with a duration of less than 3 weeks, prolonged cough, with a duration of 3 to 8 weeks, and chronic cough, with a duration of 8 weeks or longer. The most frequent cause of acute cough is cold syndrome by viral infection. The major three causal diseases of chronic cough are sinobronchial syndrome, cough variant asthma, and atopic cough. Prolonged cough after cold syndrome (cough after infection) is added to these as etiology of prolonged cough. The causative organisms with higher frequency for cough after infection may include *Bordetella pertussis*, *Mycopalsma pneumoniae*, and *Chlamydophila pneumoniae*. In this study, we examined whether Q fever caused by *Coxiella burnetii*, which is a major causative organism along with *M. pneumoniae*, and *C. pneumoniae* of atypical pneumonia, causes adult prolonged cough.

## SUBJECTS AND METHODS

### *Subjects*

The subjects were patients who visited Kawasaki Hospital, Kawasaki Medical School from April 2007 to March 2011 complaining of prolonged cough (duration of 3 weeks or longer) showing no abnormality on chest radiograph. There were 32 males and 62 females aged from 19 to 78 years (48.1 ± 20.4 years).

### *Methods*

At initial consultation, serum antibody value

Corresponding author
Niro Okimoto
Department of General Internal Medicine 1, Kawasaki Hospital, Kawasaki Medical School, 2-1-80 Nakasange, Kitaku, Okayama, 700-8505, Japan
Phone : 81 86 225 2111
Fax : 81 86 232 8343
E-mail : n.okimoto@kawasaki-hp.jp

of Q fever was measured by ELISA kit (PanBio, Australia). For both IgM and IgG, an index value (ID) of 11 or greater was considered positive. Paired serum was not obtained.

## RESULTS (Table 1)

In 94 patients with prolonged cough, only one patient (1.1 %) (male aged 26 years, IgM, 16.56) showed an ID of IgM 11 or greater, and none showed an ID of IgG 11 or greater.

Table 1. Serum antibody of *Coxiella burnetii* in patients with persistent cough

| | |
|---|---|
| IgM > 11 | 1 / 94 (1.1%) |
| IgG > 11 | 0 / 94 ( 0% ) |

## DISCUSSION

*C. burnetii* (causative organism of Q fever) is considered to be the causative organism for atypical pneumonia, as are *M. pneumoniae*, *C. pneumoniae*, and *Legionella pneumonphila* according to the JRS guideline for the management of community-acquired pneumonia in adults[2]. Previously, we have reported that Q fever was involved in 4 (1.4 %) of 284 community-acquired pneumonia patients[3], in 6 (6.7 %) of 89 patients suffering from bronchial asthma attack[4], in 2 (2.5 %) of 80 patients with chronic lower respiratory tract infection developing acute exacerbation[5], while in hospital-acquired pneumonia, involvement of Q fever was extremely rare; 0 (0 %) of 121 hospital-acquired pneumonia patients[6].

In this study, we examined whether Q fever causes prolonged cough. According to the results, one (1.1 %) of 94 patients with prolonged cough showed a high value of IgM, suggesting acute infection of Q fever.

We used ELISA kit produced by PanBio for diagnosis of Q fever. The specification of the kit indicates that index value (ID) 11 or greater should be used to judge positive for both IgM and IgG. However, comparison of this kit with the indirect fluorescent antibody technique, which is considered the international standard, revealed that this kit is more sensitive than the indirect fluorescent antibody technique, and some investigators recommend that ID 10-16 should be regarded as a low positive[7]. Others, however, point out differences between foreign and domestic epidemic strains. It is advisable, therefore, to establish a diagnostic standard in Japan by verifying domestic cases which occur frequently[8]. The positive case in this study had a high value of IgM, 16.56, thus was reasonably diagnosed as Q fever.

This study is limited to examination at initial consultation, and pair serum was not obtained. An evaluation of pair serum may reveal patients with increased IgG and show that the frequency of Q fever involving prolonged cough to be higher.

It is reported that cough after infection in adults occurs due to *B. pertussis* in 6-21 %[1, 9], due to *M. pneumoniae* in 1-6 %[9, 10], and due to *C. pneumoniae* in 4-7 %[9, 11, 12]. In children, the causative organism for cough after infection is reported to be *B. pertussis*, and *M. pneumoniae*[13, 14].

The involvement of Q fever in cough after infection has not been reported in the past reports. This study revealed that the frequency of Q fever in cough after infection is approximately 1 %, and should, therefore, be considered a causative organism for prolonged cough, though its frequency is lower than that of *M. pneumoniae*, and *C. pneumoniae*.

We would like to examine pair serum of Q fever in patients with cough after infection and the involvement of *L. pneumonphila*, which is a atypical pathogen of cough after infection, hereafter.

## REFERENCES

1) The committee for the JRS guideline in management of cough: The JRS guideline in management of cough. Tokyo,Kyorinsya. 2005, pp2-3
2) The committee for the JRS guideline in management

of respiratory infections: The JRS Guidelines for the Management of Community-Acquired Pneumonia in Adults. Tokyo,Kyorinsya. 2005, pp24-27

3）Okimoto N, Asaoka N, Osaki K, KuriharaT,Yamato K, Sunagawa T,Fujita K,Ohaba H,Nakamura J, Nakada K: Clinical features of Q fever pneumonia. Respirology 9:278-282,2004

4）Okimoto N, Asaoka N, Yamato K, Honda Y,Kurihara T, Osaki K, Fujita K,Ohba H: Q fever(*Coxiella burnetii* infection) and acute exacerbation of bronchial asthma. Intern Med 44:79-80,2005

5）Okimoto N, Kibayashi T, Mimura K, Yamato K, Kurihara T, Honda Y, Osaki K, Asaoka N,Ohba H: *Coxiella burnetii* and acute exacerbations/infections in patients with chronic lung disease. Respirology 12:619-621,2007

6）Okimoto N, Nanba F, Kibayashi T, Kishimoto M,Yamato K, Kurihara T, Honda Y,Osaki K,Asaoka N: Q fever in hospital-acquired pneumonia. Nihon Kokyuki Gakkai Zasshi 46:189-190,2008

7）Setiyono A, Ogawa M, Kishimoto H, et al. The criteria of IF method and Elisa method in diagnosis of Q fever. J J A Inf D 78:173,2004

8）Watanabe A. The point of diagnosis of Q fever-Timing of measurement of antibody of *Coxiella burnetii*-. In: Saito A, editor. Pitfalls and knack in management of infectious diseases. Tokyo, Nakayamasyoten. 2004, pp172-173

9）Ishida T, Yokoyama T, Iwasaku M, Saigusa M, Fukuyama H, Nakagawa H, Yoshioka H,Tachibana H, Arita M, Hashimoto T: Clinical investigation of postinfectious cough among adult patients with prolonged cough. Nihon Kokyuki Gakkai Zasshi 48:179-185,2010

10）Wright SW, Edwards KM, Decker MO, Grayston JT, Wang S: Prevalence of positive serology for acute Chlamydia *pneumoniae* infection in emergency department patients with persistent cough. Acad Emerg Med 4:179-183,1997

11）Birkebaek NH, Jensen JS, Seefeldt T, Degn J, Huniche B, Andersen PL, Ostergaard L: *Chlamydia pneumoniae* infection in adults with chronic cough compared with healthy blood donors. Eur Respir J 16:108-111,2000

12）Miyashita N, Fukano H, Yoshida K, Niki Y, Matsushima T: *Chlamydia pneumoniae* infection in adult patients with persistent cough. J Med Microbiol 52:265-269,2003

13）Kaneko K, Yamashiro Y, Maruyama T, Obinata K: *Chlamydia pneumoniae* infection in children persistent cough. Arch Dis Child 80:581-582,1999

14）Hallander HO, Gnarpe J, Gnarpe H, Olin P: *Bordetella pertussis*, *Bordetella parapertussis*, *Mycoplasma pneumoniae*, *Chlamydia pneumoniae* and persistent cough in children. Scand J Infect Dis 31:281-286,1999