

Spontaneous Cure of Acute Bronchitis Caused by *Chlamydia pneumoniae* in a 15-Year-Old Boy

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ABSTRACT

Chlamydia pneumoniae was isolated from the pharyngeal swab of a 15-year-old patient with acute bronchitis. The serum IgM antibody against *C.pneumoniae* was elevated up to 160-fold in the acute phase and decreased to 20-fold in the convalescent phase using the microimmunofluorescence (MIF) test. IgG antibody titers in the acute phase and the convalescent phase were 40-fold and 160-fold respectively using the MIF test. The patient recovered from the bronchitis without any effective treatment, indicating spontaneous cure of the disease.

Key words: *Chlamydia pneumoniae* infectin, Acute bronchitis

The genus *Chlamydia* is now classified into three species, *C. trachomatis*, *C. psittaci* and *C. pneumoniae*. Recently, Fukushi and Hirai⁴⁾ proposed the establishment of a new species, *C. pecorum* which is derived from ruminants. The TWAR strain of *C.pneumoniae*, formerly designated *C.psittaci*, was separated as a new species according to DNA homology, morphology, antigenicity and biological characteristics⁷⁾. The designation TWAR comes from the laboratory code of the first two isolates (TW-183 and AR-39) at the University of Washington in Seattle¹⁴⁾. The pathogenicity of *C.pneumoniae* in human diseases has not been well established. In fact, *C.pneumoniae* has been isolated from healthy persons^{5,10)}, and antibodies to *C.pneumoniae* have been detected in more than half of healthy adults^{8,11)}. However, *C.pneumoniae* has been reported as a causative organism of acute respiratory diseases such as upper respiratory tract infection, bronchitis and pneumonia^{2,6,8,9,16,21)}. We report a patient with acute bronchitis, from whom *C.pneumoniae* was isolated. The patient spontaneously recovered from the disease.

CASE REPORT

A 15-year-old boy developed a cough and fever of 38°C on May 17, 1991. On May 20, he became afebrile without any medication. He consulted us on May 29 because of a persistent cough and chest pain. He received no medication until his visit to our hospital. On physical examination,

there were no abnormalities except a coarse respiratory sound on auscultation. The chest X-ray film at his initial visit showed an increment of pulmonary marking, and a diagnosis of acute bronchitis was made. The C-reactive protein was negative and antibodies to *Mycoplasma pneumoniae* were not detected. No viruses were isolated from the pharyngeal swab. Oral administration of Cefaclor (CCL, Shionogi Pharmaceutical Co. Ltd., Osaka, Japan)¹⁸⁾ was started at 800 mg per day and the symptoms improved within 2 days. Serological diagnosis was conducted by a microimmunofluorescence (MIF) test¹⁹⁾ on the serum obtained in the acute phase (May 29) and convalescent phase (August 8). The IgM antibody titer against *C.pneumoniae* was elevated up to 160-fold in the acute phase and decreased to 20-fold in the convalescent phase. IgG antibody titers in the acute phase and the convalescent phase were 40-fold and 160-fold, respectively. These findings confirmed that the patient had contracted a respiratory tract infection caused by *C.pneumoniae* (Fig. 1).

Using tissue cultures of HeLa 229 and HL cells, *Chlamydia* sp. was successfully isolated from the pharyngeal swab of the patient. Intracytoplasmic inclusions with specific fluorescence were detected in the isolated *Chlamydia* YK-41 strain by DFA with the genus-specific monoclonal antibody (Cultureset®, Ortho Diagnostic Systems Inc., USA) and IFA with *C.pneumoniae* TWAR-specific monoclonal antibody (RR-402) kindly pro-

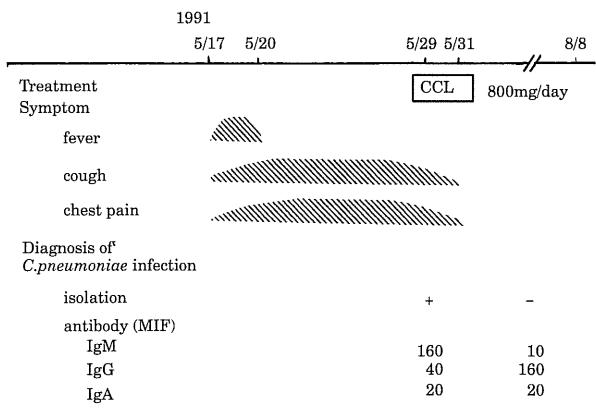


Fig 1. Clinical course

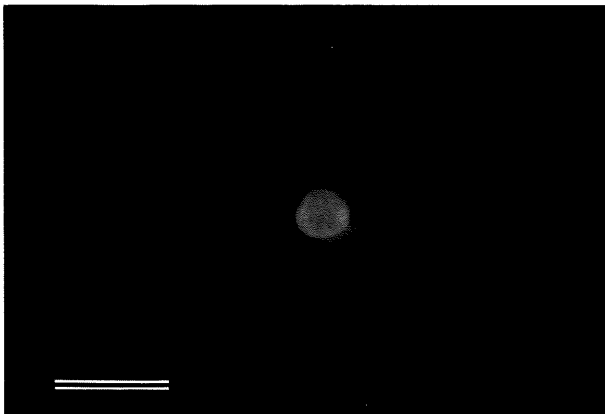


Fig. 2. The inclusion bodies of *C.pneumoniae* strain YK-41 in HL cell culture stained with FITC-conjugated with *C.pneumoniae* specific monoclonal antibody (RR-402). Bar=50 μ m.

vided by Washington Research Foundation (Fig. 2). The inclusions were not stained with *C.trachomatis* species-mono-clonal antibody (Micro Tract[®], Syva Corporation, USA), and were negative for the iodine staining. These characteristics are those of *C.pneumoniae*, and indicate that the isolated YK-41 strain was a member of *C.pneumoniae*. *C.pneumoniae* was not isolated from the pharyngeal swab collected on August 8, 1991.

DISCUSSION

Recent work from several laboratories have shown the pathogenicity of *C.pneumoniae* in human respiratory diseases^{2,6,8,9,16,21}. We report a patient with acute bronchitis caused by *C.pneumoniae*. The patient was treated with CCL, a cephem antibiotic characterized to exert inhibition of cell wall synthesis. However, the clinical improvement of our patient was not associated with administration of CCL because *C.pneumoniae* has

no cell wall. An *in vitro* susceptibility test¹² of *C.pneumoniae* YK-41 strain to CCL revealed a minimum inhibitory concentration (MIC) of over 128 μ g/ml. These findings indicated spontaneous recovery from *C.pneumoniae* infection. To our knowledge, this is the first report on not only the serologic evidence of *C.pneumoniae* infection but also on the culture of the organism from a patient spontaneously cured.

Infections caused by *C.pneumoniae* are mainly diagnosed by serologic methods^{2,6,9,16}, because the initial isolation of *C.pneumoniae* from patient material is difficult. Two serodiagnostic tests have been used routinely for chlamydial infection, the complement fixation (CF) test and the MIF test¹. Since the CF test measures cross-reactive antibodies against the genus *Chlamydia*, this test is not useful in making an accurate diagnosis of infections with *C.pneumoniae*. Grayston et al⁶ reported that a positive CF test was not uniformly seen in cases of *C.pneumoniae* infection. The MIF test has proven to be the most sensitive method of serodiagnosis of *C.pneumoniae* infection. This test can distinguish between antibodies in the IgM and IgG serum fractions and is very useful in determining current infection versus previous infection. Our patient had an MIF IgM titer of 160 and an IgG titer elevated fourfold, suggesting that the MIF test is specific for acute *C.pneumoniae* infection when conservative criteria for antibody titers are used⁸. Several studies have compared various cell lines for the isolation of *C.pneumoniae*^{3,15,17,20}. The cell line HeLa 229 has been used most often for culturing *C.pneumoniae*^{6,9}. Recently, HL cells^{3,15} and HEp-2 cells^{16,19} have been reported to be more efficient than HeLa 229 cells for growing *C.pneumoniae*. Fortunately, *C.pneumoniae* was isolated using HeLa 229 cells and HL cells in this case. Comparison of the inclusion sizes of the isolates in the primary culture revealed that the inclusions in HL cells were significantly larger than those in HeLa 229 cells, which confirms the report that HL cell line is superior to HeLa 229 cell line for growing *C.pneumoniae*.

Although *C.pneumoniae* has been recently described as a pathogen etiologically associated with respiratory infections in young adults²¹, the importance of this agent in children has not been well defined. The clinical symptoms in our patient were not serious and the patient promptly recovered spontaneously. Therefore, the *C.pneumoniae* infection may be a mild illness in most patients in childhood, and most patients may be treated without a definite diagnosis. Further accumulation of cases will clarify the role of *C.pneumoniae* in respiratory infections in childhood.

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