Eur J Med Res (2010) 15(Suppl. II): 112-114 

# Respiratory Infection Caused by Chlamydophila Pneumoniae in Children and Adolescents in the Lower Silesia Region of Poland

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**Abstract**

*Objective:* To assess the incidence of *Chlamydia pneumoniae* respiratory tract infection in children and adolescents in the Lower Silesia Region in Poland in 2009.

*Material and methods:* 641 throat swabs obtained from 326 girls and 315 boys, aged 11 months to 18 years, were assessed diagnostically. The patients enrolled into the study were treated on an outpatient basis due to various, non-specific respiratory ailments. The most common presenting clinical symptom of a respiratory problem was dry cough, which occurred in 295 studied subjects, followed by runny nose and cough with discharge in 176 subjects, and other minor symptoms in 35 subjects. The assessment was conducted by an indirect immunofluorescence antibody (IFA) Chlamydia Testing kit (Cellabs, Sydney, Australia).

*Results:* Overall, *Chlamydia* infection was detected in the respiratory tract in 43.1% (276/ 641) of the children, with no clear gender differences. Of the 295 subjects presenting with dry cough, 122 (41.4%) had positive tests for *Chlamydia*. Of the 176 subjects with runny nose and cough and the 35 subjects with other symptoms, 83 (47.2%) and 8 (22.9%) had positive tests for *Chlamydia*, respectively. In the asymptomatic children who had direct contact with a *Chlamydia* infected person, there were 29.6% (8/27) positively tested cases, whereas in the children presenting symptoms, the percentage of positive tests was 48.3% (29/60).

*Conclusions:* In children living in the Lower Silesia Region of Poland, there is a substantial ~50% rate of *Chlamydia* infection, transmitted *via* airborne droplets. The finding of *Chlamydia* infection should be the signal for testing other subjects from the child's closest environment.

*Key words: Chlamydophila pneumoniae*, infection, cough

## Introduction

*Chlamydophila pneumoniae* is a common etiological factor of the respiratory tract infections, including pharyngitis, bronchitis, and pneumonia [1]. It is estimated that *C. pneumoniae* is responsible for pneumonia in approximately 10% of cases, and for bronchitis and sinusitis in approximately 5% of cases [2, 3]. The main symptoms of infection include cough, pharyngitis and, hoarseness, often accompanied by sinusitis [4]. The course of infection may be biphasic. Pharyngitis occurs in the first phase, followed by bronchitis or pneumonia in the second phase of a disease. Prolonging cough (for more than 3 weeks) is a basic symptom indicating *C. pneumoniae* infection [4-6]. Respiratory tract infections of *C. pneumoniae* etiology are characterized by a long incubation period, usually lasting 14-21 days. The course of disease is age-dependent. The clinical symptoms of infection in children are mild compared with elderly people. Untreated infections can lead to many complications, such as exacerbations of bronchial asthma, endocarditis, coronary heart disease, endothelitis, and abortions [7-9].

The aim of this study was to assess the incidence of chlamydial respiratory tract infections in children and adolescents in the Lower Silesia Region of Poland in the year 2009.

## Material and Methods

The study was performed in accordance with the Declaration of Helsinki for Human Research and the study protocol was accepted by institutional Ethics Committee.

In 2009, children treated for various, non-specific respiratory illnesses in different hospital wards, in clinical departments, or as outpatients (mainly from family practices) in the Lower Silesia region were investigated for *C. pneumoniae* infections. The study materials were 641 throat swabs obtained from 326 girls and 315 boys, aged 11 months to 18 years. Past medical history of these patients was indicative of recurrent respiratory tract infections, long-lasting paroxysmal dry cough, rhinitis, and hoarseness. Clinical diagnoses were: bronchitis, pneumonia, sinusitis, and laryngitis. Throat swabs from the posterior wall of the pharynx were made before the start of any treatment, with the use of thin, sterile disposable swabs. Tests for the presence of *C. pneumoniae* antigens in throat

swabs were performed by an indirect immunofluorescence antibody (IFA) technique, using the Chlamydia Cel PN testing kits (Cellabs Pty Ltd., Sydney, Australia).

## Results and Discussion

The results are presented in two tables. Table 1 presents the results of throat swabs examination for *C. pneumoniae* in 641 children. The positive IFA test results were shown in 276 patients (43.1% of the study group), including 41.4% of girls and 44.8% of boys. The proportion of positive results was strikingly large, and it should be taken into consideration regarding epidemiologic assessment, differential diagnosis, and therapeutic management.

*Table 1*. Results of IFA studies for *C. pneumoniae* in throat swabs in children.

| | Total | Boys | Girls |
|---|---|---|---|
| Number of cases | 641 | 315 | 326 |
| Positive results | 276 | 141 | 135 |
| % | 43.1 | 44.8 | 41.4 |

The presence of *C. pneumoniae* antigens in children depending on the diagnosis and the clinical symptoms is shown in Table 2. In the group of children with features of infection which manifested itself in the form of dry cough, the proportion of positive results for *C. pneumoniae* was 41.4%, and in the children with cough, rhinitis, and discharge from the throat – 47.2%. An assumption can be made that these are the dominant clinical symptoms of infection, since other symptoms like hoarseness occurred only in 22.9% of the examined subjects. In the group of children with symptoms of infection and having contact with sick people around them, the proportion of positive findings for *C. pneumoniae* was 48.3%, whereas in the children without infection in their environment this proportion was as low as 29.3%. That shows that there was a high probability of transmitting infection with cough or as droplet infection. In the group of children followed up for 14 days after the end of treatment, the presence of *C. pneumoniae* antigens was revealed in 54.2%. The latter observation is of a substantial interest to us, since it could have a bearing on further patients' management. The significance of this observation is, however, hampered by a relatively small number of patients, 48 (17.3%) out of the group of 276 with positive tests for the presence of *C. pneumoniae* antigens, who were followed up.

## Conclusions

The following conclusions can be drawn from the findings of this study:

- In the group of children and adolescents from the Lower Silesia Region a large number of *C. pneumoniae* airborne and droplet infections were revealed;
- The most common clinical symptoms were dry cough lasting for more than 3 weeks and rhinitis;
- The diagnosis of the respiratory tract infection in a child caused by *Chlamydia* should be the signal for a thorough examination of people from its closest circle;
- Patients treated with antibiotics should always be followed up, because in nearly 50% of them the presence of *Chlamydia pneumoniae* can still be detected.

*Conflicts of interest:* The authors declare no conflicts of interest in relation to this article.

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*Table 2*. Presence of *C. pneumoniae* antigen in children depending on diagnosis and clinical symptoms.

| Symptoms | Dry cough | Cough, rhinitis, discharge | Other symptoms | Patients from environment with features of infection | Patients from environment without features of infection | Follow-up after the previous treatment |
|---|---|---|---|---|---|---|
| Number of cases | 295 | 176 | 35 | 60 | 27 | 48 |
| Positive results | 122 | 83 | 8 | 29 | 8 | 26 |
| % | 41.4 | 47.2 | 22.9 | 48.3 | 29.6 | 54.2 |

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