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## Detection of *Chlamydomphila Pneumoniae* Antigens in Children in the Lower Silesia Region in 2011

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A – research concept and design; B – collection and/or assembly of data; C – data analysis and interpretation; D – writing the article; E – critical revision of the article; F – final approval of article; G – other

### Abstract

**Background.** The majority of *Chlamydomphila pneumoniae* infections are asymptomatic. Symptomatic infections due to *C. pneumoniae* are associated with upper and lower respiratory tract infections.

**Objectives.** Analysis of the frequency of *C. pneumoniae* antigens detection in children in the Lower Silesia Region in 2011.

**Material and Methods.** 303 throat swabs obtained from 130 girls and 173 boys, aged 20 months to 18 years, were tested. The patients who were entered into the study were treated due to various respiratory disorders. Examinations were performed by IFA technique, using the Chlamydia Cell PN testing kits (Cellabs Pty Ltd., Sydney, Australia).

**Results.** The presence of *C. pneumoniae* antigen was detected in 95/303 (31.4%) of all examined children (in 48/130 (36.9%) of girls and in 47/173 (27.2%) of boys). In the group of patients with dry cough, as the most common presenting clinical symptom of respiratory infection, the positive IFA test results for *C. pneumoniae* occurred in 32 out of 94 (34.0%) of girls and in 34 out of 117 (29.1%) of boys. In the case of the examined children with other prevailing clinical symptom, which included a cough with discharge and a runny nose, the positive tests for *C. pneumoniae* were shown in 13 out of 27 (48.1%) of girls and in 9 out of 42 (21.4%) of boys. In the group of children without symptoms of infection, who had direct contact with *C. pneumoniae* infected person, there were 3 out of 9 (33.3%) of girls and 4 out of 14 (28.6%) of boys positively tested cases.

**Conclusions.** Results of IFA studies for *C. pneumoniae* in throat swabs in children varies according to clinical symptoms and seasonality. There were no clear gender and age-related differences. *C. pneumoniae* test should be considered only after the presence of microorganisms typical of respiratory infections has been excluded (*Adv Clin Exp Med* 2014, 23, 3, 411–414).

**Key words:** *Chlamydomphila pneumoniae*, IFA test, clinical symptoms.

*Chlamydomphila pneumoniae* (*C. pneumoni-ae*) infection is very common in the world and has no distinctive image; it is generally mild and self-limiting [1]. Humans are the sole source of the infection. The infection is spread by droplet route probably from asymptomatic carriers. Infection occurs most often in subjects between 5 and 15 years of age. The incubation period of the disease is 1–2 weeks [2].

Infections with these bacteria are present throughout the year, but their greatest intensity is observed in autumn and winter. These infections can spread like epidemics.

Recent studies confirm that *C. pneumoniae* is a common etiologic factor for upper respiratory tract infections besides bronchitis and community-acquired pneumonia in children [1, 3]. The onset of the infection is usually gradual, rarely acute, accompanied by a slight fever, with or without elevated body temperature, with rhinitis. It is characterized by hoarseness and long-lasting dry cough, which may be accompanied by a sore throat [4]. Chronic cough and bronchial hyperreactivity persist longest in children under 4 years of age. In the group of older children pharyngitis, tonsillitis, sinusitis and otitis media are often observed [5].

*C. pneumoniae* exhibit specific tropism and cytotoxic activity directed to the airway epithelium, where they multiply and destroy infected cells by lysis. In the chlamydial infections cilia movement disorders are observed, and specific humoral and cellular immune responses and local inflammation develop [4, 6].

*C. pneumoniae* plays an important role in chronic diseases, and as a coexisting pathogen in acute diseases. It often causes acute exacerbations of asthma and chronic obstructive pulmonary disease [7]. It is also an etiological factor of approximately 10% of community-acquired pneumonia [8].

In recent years, *C. pneumoniae* microorganisms have generated high scientific interest as important pathogens of many chronic diseases, whose possible bacterial etiology until recently has not been considered [9].

## Material and Methods

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

The authors examined 303 patients who showed symptoms of respiratory tract infections. The patients were divided into two groups. The first group consisted of children from 20 months to 4 years of age and the other, from 5 to 18 years of age. Materials consisted of swabs taken from the back of the throat of children treated in different pediatric wards in Wrocław and Lower Silesia, as well as outpatients.

The study was performed in Chlamydiosis Research Laboratory at the Department of Microbiology, Wrocław Medical University. Samples were prepared immediately after the material was collected from the patients for the indirect immunofluorescence test using the Chlamydia Cell PN testing kit Pty Ltd., Sydney, Australia). Indirect immunofluorescence technique – *Chlamydia pneumoniae* test detects fluorescing elementary bodies in direct smears of materials taken from the back of the throat.

## Results and Discussion

The results were presented in four tables. Table 1 demonstrates the results of IFA studies for *C. pneumoniae* in throat swabs in 303 children. The presence of *C. pneumoniae* antigen was detected in 95/303 (31.4%) of all examined children (in 48/130 (36.9%) of girls and in 47/173 (27.2%)

**Table 1.** Detection of *C. pneumoniae* antigen in throat swabs in children

Gender	Boys	Girls	Total
Number of examined	173	130	303
Positive IFA test	47	48	95
%	27.2	36.9	31.4

**Table 2.** Detection of *C. pneumoniae* antigen depending on age of children

Age group	20 months– –4 years old	5 years old– –18 years old
Number of examined	139	164
Positive IFA test	44	51
%	32	31

of boys). The proportion of *C. pneumoniae* antigens detected in children in 2011 in the Lower Silesia was reduced when compared to 2009 [10].

The results of *C. pneumoniae* antigens detected in children on the basis of the clinical symptoms are shown in Table 2. In the group of patients with dry cough, as the most common presenting clinical symptom of respiratory infection, the positive IFA test results for *C. pneumoniae* occurred in 32 out of 94 (34.0%) of girls and in 34 out of 117 (29.1%) of boys. In the case of examined children with other prevailing clinical symptom, which was cough with discharge and runny nose, the positive tests for *C. pneumoniae* were shown in 13 out of 27 (48.1%) of girls and in 9 out of 42 (21.4%) of boys. In the group of children without symptoms of infection, who had direct contact with *C. pneumoniae* infected person, there were 3 out of 9 (33.3%) of girls and 4 out of 14 (28.6%) of boys positively tested cases.

Principi & Esposito [3] from the 613 children treated at a hospital because of acute lower respiratory tract infection, the *C. pneumoniae* infection was confirmed in 14.1% of them. Falck et al. [11] using PCR method detected *C. pneumoniae* in throat swabs in 38 (45%) out of 85 children with acute respiratory tract infection. These children were diagnosed mostly with acute upper respiratory tract infection, and 4 patients had recurrent infection associated with exudative otitis media. In the control group, *C. pneumoniae* genetic material was detected in 5 (5.7%) out of 93 healthy children.

The results of IFA studies for *C. pneumoniae* depending on age of children are presented in Table 3. There were no significant differences in the incidence of infections caused by *C. pneumoniae*

**Table 3.** Detection of *C. pneumoniae* antigen in children depending on clinical symptoms

Clinical symptoms	Dry cough		Runny nose and cough with discharge		Direct contact without symptoms	
	girls	boys	girls	boys	girls	boys
Number of examined	94	117	27	42	9	14
Positive IFA test	32	34	13	9	3	4
%	34	29.1	48.1	21.4	33.3	28.6

**Table 4.** Detection of *C. pneumoniae* antigen depending on season of the year

Seasonality	January–April	May–August	September–December
Number of examined	139	84	80
Positive IFA test	58	10	27
%	42	12	34

depending on the age group of the children. *C. pneumoniae* acute upper respiratory tract infections occur in 3–58% of children of all ages. Normann et al. [12] using the PCR method, found *C. pneumoniae* in 10% of children under 2 years of age with acute respiratory tract infections, in

19% between 2 and 4 years of age and 21% in the group 5–16 years of age.

The presence of *C. pneumoniae* antigens in children depending on the season of the year is shown in Table 4. Authorial results from 2011 show that the largest proportion of *C. pneumoniae* infections among children occur in winter (January–April), and there was the least number of positive IF results obtained in summer (May–August), which is 42% and 12% respectively. The Study of Kicinski et al. [13] presented an analysis of the seasonal incidence of *Chlamydomphila pneumoniae* infections.

The authors concluded that results of IFA studies for *C. pneumoniae* in throat swabs in children vary according to clinical symptoms and seasonality. There were no clear gender and age-related differences. *C. pneumoniae* test should be considered only after the presence of microorganisms typical of respiratory infections has been excluded.

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