

The possible association between Chlamydia pneumoniae infection and asthma.

Mahmood Sh. Al-Zaidi* MBChB, FICMS
Haider S. Kadhim* MBChB, MSc, PhD
Haider Ahmed Shemran* BSc, MSc

Summary:

Background: Many etiological factors have been implicated in the pathogenesis of Asthma like; viruses, bacteria and Chlamydia pneumoniae. This study focuses on the role of Chlamydia pneumoniae in asthma pathogenesis.

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Patients and Methods: The detection of Anti-Chlamydia pneumoniae antibodies IgA, IgM and IgG in patients by ELISA, for 35 patients, 18 asthmatic patients, 12 patients with chest infection with no history of asthma, and 5 apparently healthy as control subjects.

Results: The results showed that 80% and 70% of the patients were negative for anti- Chlamydia pneumonia antibodies IgA and IgM respectively, while significantly ($p < 0.05$) high number (73%) of patients were positive for IgG, of which significant number ($p < 0.05$) of them, 63% were asthmatic and 36% were non-asthmatic chest infection.

Conclusion: this study may support the association between Chlamydia pneumoniae and asthma.

Keywords: Chlamydia pneumoniae, Asthma, Chest infection

Introduction:

The role of infectious agents in chronic inflammatory disease processes has become an active area of investigation. There are data to suggest that infectious organisms, particularly the atypical bacteria, Chlamydia pneumoniae may be involved in asthma pathogenesis (1, 2). Certainly there are considerable data implicating this organism in the exacerbation of asthma (3, 4). Asthma is a chronic inflammatory disorder of the airway in which many cells play a role, in particular, mast cells, eosinophils and T- lymphocytes. It is characterized by airway hyperresponsiveness with recurrent episodes of wheezing, breathlessness (5). In addition to the inflammatory basis of asthma, it is well established that asthma is a complex genetic disease that can not be explained by a single gene and results from interaction between genetic and environmental factors e.g. allergens. Viral infections, occupational stimuli, fogs, fumes, exercise, drug (5). Chlamydia is obligate intracellular gram negative eubacteria. Chlamydia pneumoniae is a common respiratory pathogen and is transmitted from human to human with no intervening avian or mammalian host, and is responsible for 10% of community- acquired pneumonia and 5% of bronchitis (6). It is recently reported that Chlamydia pneumoniae is associated with asthma, atherosclerosis, multiple sclerosis and lung cancer and C. pneumoniae may trigger acute exacerbation of adult asthma (7). In this study we tried to assess the association between seropositive Immunoglobulin to Chlamydia

pneumonia in patients with chest infection without asthma and in asthmatic patients.

Patients and Methods:

Thirty five patients included in this study, classified as follows: Group A: 18 asthmatic patients, Group B: 12 patients with chest infection with no history of asthma, and Group C: 5 apparently healthy, control subjects. All patients were referred from specialists after thorough clinical examinations in Al-Kadhimiya Teaching Hospital. Sera were withdrawn from all patients and kept in refrigerator until Enzyme Linked Immuno-Sorbant Assay (ELISA) were done to detect Immunoglobulins IgA, IgM and IgG specific to Chlamydia pneumoniae in the sera of 3 groups of patients. ELISA was done according to manufacturer leaflet instruction (EUROIMMUN, Denmark). Briefly, 100ul of standards and diluted patients' sera were added to ELISA plate, left for 30 min at room temperature. After that 3 times washing done, then applying peroxidase-labelled anti-human Ig for 30 min at room temperature. Washing as mentioned previously and then a freshly prepared substrate-chromogen were added to each well, left for 15 min at room temperature, then a stopping solution was added and results were obtained by reading the plate by ELISA reader at 450 nm wave length.

Statistical Analysis:

The readings were statistically analyzed by Chi-square through SPSS program and readings were considered significant ($p < 0.05$).

*Dept. of Medical Microbiology, College of Medicine, Al-Nahrain University.

Results:

In this study the mean age of the patients was 40 years and there were 11 males and 24 females (figure 1). The results of ELISA were shown in table (1).

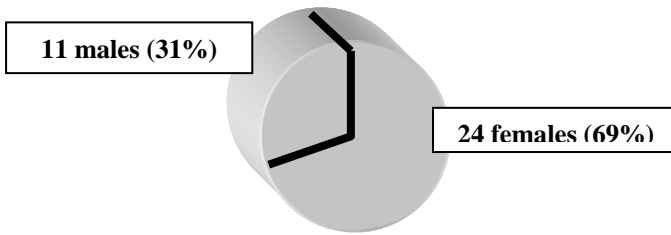


Figure 1 showing sex distribution of patients included in study

Table (1) shows the results and the number and percent of patients with chest infection and asthma

Antibody		Chest Infection		Asthma		Total	
Ig	Results	No.	%	No.	%	Total	%
IgA	Positive	2	33.3 %	4	66.7 %	6	20 %
	Negative	10	41.7 %	14	58.3 %	24	80 %
IgM	Positive	5	55.6 %	4	44.4 %	9	30 %
	Negative	7	33.3 %	14	66.7 %	21	70 %
IgG	Positive	8	36.4 %	14	*63.6 %	22	*73.3 %
	Negative	4	50%	4	50%	8	26.7 %
Total		12		18		30	

*Significant ($p < 0.05$)

The results showed that 80% and 70% of the patients were negative for anti-*Chlamydia pneumoniae* IgA and IgM respectively. Significant results were shown ($p < 0.05$) in the anti-*Chlamydia pneumoniae* IgG antibody as 73% of patients were positive, 63% were asthmatic and 36% were non-asthmatic chest infection.

Discussion:

Previous studies showed an association of *Chlamydia pneumoniae* infection with asthma depending on different modes of detection including Ig detection. In this study, we may support this association, as our results of anti-*Chlamydia pneumoniae* antibodies IgG in patients with asthma significantly ($p < 0.05$) high as 63.6% of the patients with positive result while 36.4% of the positive results were chest infection without asthma. This goes with Kraft et al, 2002 (8) as they showed that *C pneumoniae* are present in the airways in 55% of the patients with chronic asthma studied. In addition to other studies Cunningham et al (4), Miyashita et al (7), Mihai et al (9), and Zaitso (10) all prove the

relation of *Chlamydia pneumoniae* infection with asthma. A possible mechanism for such association, is that the organism is difficult to eradicate, as macrolides are bacteriostatic, which may result in a chronic state of infection/colonization (2). Moreover, the IgG is a sign of chronic disease and this give more support for chronicity. In conclusion, this study may demonstrate the possible association between *Chlamydia pneumoniae* infection with asthma.

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