

Serveur Académique Lausannois SERVAL serval.unil.ch

Author Manuscript

Faculty of Biology and Medicine Publication

This paper has been peer-reviewed but does not include the final publisher proof-corrections or journal pagination.

Published in final edited form as:

Title: Chlamydia pneumoniae: possible association with asthma in children.

Authors: Asner SA, Jatou K, Kyprianidou S, Nowak AM, Greub G

Journal: Clinical infectious diseases : an official publication of the Infectious Diseases Society of America

Year: 2014 Apr

Volume: 58

Issue: 8

Pages: 1198-9

DOI: 10.1093/cid/ciu034

In the absence of a copyright statement, users should assume that standard copyright protection applies, unless the article contains an explicit statement to the contrary. In case of doubt, contact the journal publisher to verify the copyright status of an article.

***Chlamydia pneumoniae*, possible association with asthma in children**

Sandra A. Asner^{1,2}, MD, MSc; Katia Jaton³, PhD; Sofiaanna Kyprianidou¹, MD; Anna-Maria Libudzic Nowak¹, MD; Gilbert Greub^{2,3}, MD, PhD

¹ Unit of Pediatric Infectious Diseases and Vaccinology, Department of Paediatrics, University Hospital Center, Lausanne, Switzerland

² Service of Infectious Diseases, Department of Internal Medicine, University Hospital Center, Lausanne, Switzerland

³ Institute of Microbiology, Department of Laboratory, University of Lausanne & University Hospital Center, Lausanne, Switzerland

Corresponding author:

Professor Gilbert Greub

Institute of Microbiology

Department of Laboratory

Rue du Bugnon 48

1011 Lausanne (Vaud)

Switzerland

Tel: 0041 21 314 49 79

Fax: 0041 21 314 40 60

E-mail: gilbert.greub@chuv.ch

Keywords: *Chlamydia pneumoniae*, outbreak, asthma exacerbation, molecular diagnosis

Running title: *Chlamydia pneumoniae* and asthma

Word count: 365

Figures: 0

Table: 1

References: 7

Chlamydia pneumoniae has been recognized as a common cause of community-acquired pneumonia (CAP) and other acute respiratory tract infections (ARIs) in various age groups.¹ Lately, the prevalence of *Chlamydia*-associated ARIs decreased to less than 1.5%², as a result of (i) changes in epidemiology of *C. pneumoniae* and (ii) increased specificity of new diagnostic molecular methods. Moreover, *C. pneumoniae* infection may remain undetected since clinicians may not screen the infected population. Indeed, *Chlamydia pneumoniae* has been recently identified as an agent of asthma exacerbation and has been associated with its severity,^{3,4,5} thus reinforcing the importance to target these patients. In Lausanne, using a duplex real-time PCR, that detects *C. pneumoniae* and *M. pneumoniae* DNA⁶, we reported a 0.13% prevalence of *C. pneumoniae* positive PCRs (2/1583) and identified one patient with *C. pneumoniae*-associated asthma, who recovered with antibiotics⁷. Below, we report a case series of *C. pneumoniae* respiratory infections in children.

From 10th September to 5th December 2013, 8 children were detected positive for *C. pneumoniae* from upper respiratory tract specimens (Table). Of these, 5 were admitted for either acute asthma exacerbation or asthmatic bronchitis. All but two patients presented with chronic cough without fever nor systemic symptoms. These two patients presented a co-infection with either rhinovirus or *M. pneumoniae* and were admitted for severe respiratory distress in the intensive care unit, intubated and mechanically-ventilated, respectively for a community-acquired pneumonia (patient 7) and for a severe asthma exacerbation (patient 8). Both patients with severe clinical presentation were known for pre-existing asthma condition. All patients were successfully treated with a macrolide. Interestingly, *C. pneumoniae* infection was detected by chance in 7 patients as a result of the dual format of our PCR, because a *Mycoplasma pneumoniae* PCR was requested.

In conclusion, this report supports the role of *C. pneumoniae* in asthma exacerbation. Whether *C. pneumoniae*-associated asthma may be cured with antibiotics or will also require steroids remains yet unknown and may vary from patient to patient. This case series underlines the importance of screening asthmatic children for *C. pneumoniae*. Moreover, our findings suggest that *C. pneumoniae* prevalence is likely underestimated and children with chronic cough, even in absence of fever, should be tested for *C. pneumoniae*.

Table.

N	Age years	Gender^o	Asthmatic condition	Cough duration	Fever	ICU^o	Sample	Copies/ml	Co-infection (copies/ml)	Treatment	Treatment duration
1*	7	F	asthma	chronic	yes	no	throat	1'743'796	no	clarithromycin	14 days
2	7	M	asthma	chronic	yes	no	nasal	197'000	no	clarithromycin	10 days
3*	7	M	None	chronic	no	no	throat	3100	no	clarithromycin	10 days
4	6	M	None	chronic	no	no	nasal	60	no	azithromycin	5 days
5*	8	M	asthmatic bronchitis	chronic	no	no	NP ^o	78'000	no	clarithromycin	7 days
6*	12	F	None	chronic	no	no	NP ^o	61'000	no	clarithromycin	7 days
7	7	F	asthma	acute	yes	yes	NP ^o	170	<i>Mycoplasma pneumoniae</i> (570)	clarithromycin	14 days
8	10	M	asthma	acute	yes	yes	NP ^o	208	rhinovirus (13'071'000)	erythromycin	14 days

*patient originated from the same eastern region of VAUD canton (nearby Yverdon);

^oF: female, M: male; ^oNP : nasopharyngeal sample

^oICU: admission to the intensive care unit (patient 7, for a community-acquired pneumonia; patient 8, for a severe asthma exacerbation)

References.

1. Grayston JT, Campbell LA, Kuo CC, et al. A new respiratory tract pathogen: *Chlamydia pneumoniae* strain TWAR. The Journal of infectious diseases **1990**;161:618-25.
2. Kumar S, Hammerschlag MR. Acute respiratory infection due to *Chlamydia pneumoniae*: current status of diagnostic methods. Clinical infectious diseases **2007**;44:568-76.
3. Hahn DL, Schure A, Patel K, Childs T, Drizik E, Webley W. *Chlamydia pneumoniae*-specific IgE is prevalent in asthma and is associated with disease severity. PloS one **2012**;7:e35945.
4. Hahn DL, Peeling RW. Airflow limitation, asthma, and *Chlamydia pneumoniae*-specific heat shock protein 60. Annals of allergy, asthma & immunology : official publication of the American College of Allergy, Asthma, & Immunology **2008**;101:614-8.
5. Hahn DL, Peeling RW, Dillon E, McDonald R, Saikku P. Serologic markers for *Chlamydia pneumoniae* in asthma. Annals of allergy, asthma & immunology : official publication of the American College of Allergy, Asthma, & Immunology **2000**;84:227-33.
6. Welti M, Jaton K, Altwegg M, Sahli R, Wenger A, Bille J. Development of a multiplex real-time quantitative PCR assay to detect *Chlamydia pneumoniae*, *Legionella pneumophila* and *Mycoplasma pneumoniae* in respiratory tract secretions. Diagnostic microbiology and infectious disease **2003**;45:85-95.
7. Senn L, Jaton K, Fitting JW, Greub G. Does respiratory infection due to *Chlamydia pneumoniae* still exist? Clin Infect Dis. **2011**;53:847-848.