Published monthly by the
VIRGINIA DEPARTMENT OF HEALTH
Office of Epidemiology
P.O. Box 2448
Richmond, Virginia 23218
http://www.vdh.virginia.gov
Telephone: (804) 864-8141

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

PRESORTED
STANDARD
U.S. POSTAGE
PAID
Richmond, Va.
Permit No. 591

VIRGINIA
EPIDEMIOLOGY BULLETIN

Robert B. Stroube, M.D., M.P.H., Health Commissioner
Carl W. Armstrong, M.D., State Epidemiologist

Christopher Novak, M.D., M.P.H., Editor
Vickie L. O'Dell, Layout Editor

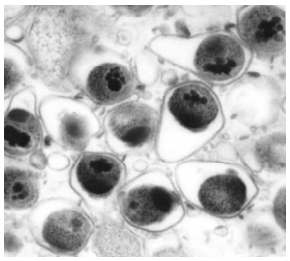
July 2006 Volume 106, No.7

Chlamydophila pneumoniae and Atypical Pneumonia

Atypical pneumonia (sometimes called 'walking pneumonia') is commonly associated with milder illness than 'typical' forms of pneumonia (e.g., those caused by *Streptococcus pneumoniae*). In fact, illness from agents of atypical pneumoniae [e.g., *Legionella pneumophila*, *Mycoplasma pneumoniae*, and *Chlamydophila pneumoniae* (formerly *Chlamydia pneumoniae*)] can be prolonged, and outbreaks can have significant attack rates and morbidity.[1]

As of August 4, 2006, four long-term care facilities in Eastern Virginia, as well as one in the Central Region, have reported outbreaks of respiratory illness. Signs and symptoms included cough, rhinitis, sore throat, hoarseness, and low-grade fever. No deaths attributed to the clusters have occurred. However, a significant proportion of residents (in some cases over 20%) required evaluation and treatment, with some residents requiring hospitalization.

The agent involved in the clusters of respiratory illness has not yet been confirmed, but *C. pneumoniae* is suspected based on initial serologic testing. This article briefly reviews *C. pneumoniae* as a cause of illness so that healthcare professionals in Virginia may consider this agent and are better able to manage this cause of community-acquired pneumonias (CAP).



Chlamydial Pneumonia

C. pneumoniae are small, gram-negative, obligate intracellular organisms.[2,3] Infections occur year round, and account for 5-15% of all pneumonias (estimated 2-5 million cases/year in the United States).[1,2] Rates of *C. pneumoniae* infection do not appear to vary significantly by season.[3] Person-to-person transmission occurs through respiratory secretions.[4]

While persons of all ages are at risk, infection with *C. pneumoniae* is most common in school-age children.[4] Elderly individuals, smokers, and people with chronic illnesses and weakened immune systems are also at risk.[1] However, while illness may be mild in adolescents and young adults, older adults may experience more severe disease.[2] Previous infection does not consistently

In This Issue:

provide protective immunity, and re-infection may occur.[3,4]

Clinical Characteristics

Most persons infected with *C. pneumonia*e are asymptomatic or develop only a mild illness. The incubation period for clinical illness is approximately 21 days. The onset of signs and symptoms is usually gradual and may include rhinitis, sore throat, and hoarseness. Pneumonia and bronchitis are the most common clinical syndromes. Symptoms may diminish over days to weeks, followed by the onset of a prominent cough (dry or productive), producing a biphasic pattern of illness.[3] Myalgias, tachypnia, dyspnea, anorexia, malaise, and confusion may also occur.[2] Low-grade fever and chills may or may not be present or reported.[3] Headache can be important as a non-classic pneumonia finding. Rhonchi and rales are present even in mild disease.[2]

Complete blood count, blood cultures, and sputum cultures are typically non-contributory in *C. pneumoniae* infection but may be useful to rule out other causes.[1,3] Although no radiographic findings are characteristic for *C. pneumoniae* pneumonia, a single, subsegmental, patchy infiltrate is commonly seen. Extensive consolidation is rare.[2]

Currently, antibody testing using paired acute- and convalescent-phase sera is the only readily available testing option.[4] However, the interpretation of serologic testing can be difficult (see box).

Other agents/conditions that may need to be considered include other bacteria [e.g., *S. pneumoniae*, Legionnaires disease/Pontiac fever, mycoplasma, psittacosis (ornithosis), Q fever, pertussis, and tuberculosis], viral infections (e.g., influenza, human parainfluenza virus, adenovirus, respiratory syncytial virus), and fungal infections.

Treatment

Doxycycline is the treatment of choice for *C. pneumoniae* pneumonia, except in children younger than nine years and pregnant women. Alternative agents include erythromycin and newer macrolides such as azithromycin and clarithromycin. Treatment should be continued for at least 10-14 days after defervescence, although shorter courses of the newer macrolides may be effective. Telithromycin is approved by the U.S. Food and Drug Administration for *C. pneumoniae* pneumonia; however, current recommendations suggest observing for liver problems.[5] Fluoroquinolones, including levofloxacin, moxifloxacin, and gatifloxacin, have some *in vitro* activity.[2,3] Consult package inserts for additional details, as needed.

In mild cases, outpatient treatment with oral antibiotics is appropriate. Severe cases may require intravenous antibiotics and oxygen supplementation.[1]

If symptoms persist, a second course with a different class of antibiotics is usually effective. However, patients should be aware that complete recovery is slow, with cough and malaise persisting for weeks to months despite appropriate treatment.[3]

If an outbreak is identified or suspected in a facility, appropriate infection control (i.e., contact and droplet) precautions should be implemented. Other control measures may also include canceling group activities, providing care and serving meals in patient rooms, restricting patient admissions, posting warnings to visitors, and cohorting staff and patients.

Conclusions

Most cases of infection with *C. pneumoniae* are mild and usually respond to treatment in an outpatient setting. However, patients with underlying disease or with concurrent infection (e.g., pneumococcal bacteremia) can develop severe illness.[2] Outbreaks in facilities such as nursing homes have been documented.[3]

Recent outbreaks of atypical pneumonia in several facilities in Virginia demonstrate that organisms such as *C. pneumoniae* can be transmitted readily, are very disruptive to residents and staff, and consume significant resources for management. Because laboratory diagnosis can be complicated and may take time, physicians and medical care facilities should report any suspected outbreaks to their local health department immediately so that efforts to reduce transmission can be implemented as soon as possible.

References

1. MedlinePlus. Atypical Pneumonia. www.nlm.nih.gov/medlineplus/ency/article/000079.htm. Accessed: August 4, 2006.
2. EMedicine. Chlamydial pneumonias. www.emedicine.com/med/topic341.htm. Accessed: August 4, 2006.
3. Mandell GL, Bennett JE, Dolin R, eds. Principles and Practices of Infectious Diseases. New York, NY: Churchill Livingstone; 2000: 2258-2261.
4. CDC. *Chlamydia pneumoniae*. www.cdc.gov/ncidod/dbmd/diseaseinfo/chlamydiapneumonia_t.htm. Accessed: August 4, 2006.
5. FDA. FDA Public Health Advisory: Ketek (telithromycin) Tablets. www.fda.gov/cder/drug/advisory/telithromycin.htm. January 20, 2006. Accessed: August 4, 2006.

Submitted by:
Christopher Novak, MD, MPH
Division of Surveillance and Investigation

Chlamydophila pneumoniae Infection – Serologic Test Interpretation[3]

Acute infection indicated by:

- Fourfold rise in *C. pneumoniae*–specific antibody at 3-4 weeks by micro immunofluorescence (MIF); or,
- Single serum samples with *C. pneumoniae*–specific immunoglobulin M (IgM) antibody titers ≥16 and/or IgG titers of ≥512 by MIF.

Note: The interpretation of the significance of an elevated IgG titer in a single acute specimen is problematic due to the high background IgG antibody prevalence in adults; therefore, the diagnosis of acute infection based on a single IG titer is not generally recommended.

The absence of detectable antibodies several weeks after the onset of infection does not exclude a diagnosis of acute *C. pneumoniae* pneumonia because the IgM antibody response may take as long as 6 weeks and the IgG antibody response may take as long as 8 weeks to appear in primary infections.

Arbovirus Update

Overall, as of August 16, 2006, arboviral activity has been relatively low across Virginia compared to previous years. No infections of West Nile virus (WNV), Eastern equine encephalitis (EEE), La Crosse encephalitis (LAC), or St. Louis encephalitis (SLE) have been detected in mammals or humans within Virginia. The exception to the low activity is significant pockets of human-biting mosquito species (e.g., *Aedes vexans*) carrying West Nile Virus (WNV) that have been found in Prince William and Fairfax Counties.

Light trap for capturing mosquitoes

One possible explanation for the WNV activity in *Ae. vexans* is that weeks of unusually high environmental temperatures may have facilitated the infection of this mosquito species. This may be a concern for many other parts of Virginia. However, since most jurisdictions in Virginia do not have mosquito surveillance capability, communities may not know if WNV has amplified to significant levels locally. If enough human-biting vector species have been infected in other parts of Virginia, human WNV cases may follow.

As a result, individuals interested in reducing their risk of arboviral infection should be advised to:

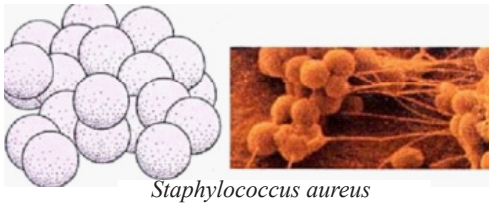
- Wear long, loose, light-colored clothing.
- If possible, stay indoors when mosquitoes are biting.
- Use insect repellant with the smallest percentage of DEET (N,N-diethyl-m-toluamide) necessary for the length of time exposed to mosquitoes, but no more than 50% for adults and 10% for children under 12. Alternatives to DEET-containing repellents include repellents with picaridin or oil of lemon eucalyptus [p-menthane 3,8-diol (PMD)].
- Turn over or remove from yard any containers where water collects, such as old tires, potted plant trays, buckets, and toys.
- Eliminate standing water on tarps or flat roofs.
- Clean out birdbaths and wading pools once a week.
- Clean roof gutters and downspout screens.

For more information about mosquito-borne diseases, visit the Virginia Department of Health website at www.vdh.virginia.gov/epi/dzee/vectorborne/index.asp.

David N. Gaines, Ph.D.
Public Health Entomologist

Staph Appreciation Day: An Outbreak Following a School Luncheon

Public health investigations lead to an improved understanding of the causes of illness in Virginia and enable local health departments to intervene to reduce the risk of future outbreaks. The following illustrates the benefits of prompt reporting of a suspected outbreak.



Staphylococcus aureus

Background: On September 2, 2005, the Prince William Health District received a report of a possible foodborne illness incident from the Emergency Room (ER) at a local hospital. Several persons had presented to the ER with gastrointestinal symptoms following a catered "Welcome Back to School" luncheon for staff at a local middle school.

Methods: Upon receipt of the report from the local hospital, a nurse and an environmental health specialist from the district health department traveled to the emergency room to interview the patients. A cohort study was undertaken and a standardized questionnaire was administered to all attendees of the luncheon. A case was defined as nausea, vomiting, abdominal cramps, diarrhea or fever, occurring in any person who attended the school luncheon on September 2, 2005.

Results: Seventy-nine school staff completed questionnaires; no children attended the luncheon. Fifty-nine persons (75%) reported becoming ill; ten sought medical attention at the ER. Seventy-six percent of persons who ate barbecued chicken became ill compared to 0% of persons who did not eat chicken (Relative Risk = undefined). Three stool samples tested at the hospital were negative for *Salmonella* spp., *Escherichia coli* O157:H7, *Yersinia* spp., and *Shigella* spp. No stool specimens were available for testing at the state laboratory. Food samples had been retained by the cafeteria manager and were obtained by the district health department. Significant levels of *Staphylococcus aureus* were found in the chicken. Nasal swabs of the food server tested positive for *S. aureus*. The chicken was prepared by a private, unlicensed caterer in his home. Numerous food preparation violations were identified and the caterer was ordered to discontinue his business.

Conclusion: This investigation underscored the importance of immediately responding to an incident. This enabled first-hand interviews with attendees, before their memories of the event faded. Interviewing the caterer within 24 hours of the event also allowed for a less biased response. Finally, rapid notification improved the chance of obtaining food samples for laboratory testing, thereby providing additional information about the likely source of the outbreak.

Submitted by: Lynn Fass, MS

Cases of Selected Notifiable Diseases Reported in Virginia*

Disease	Total Cases Reported, June 2006						Total Cases Reported Statewide, January - June		
	State	Regions					This Year	Last Year	5 Yr Avg
		NW	N	SW	C	E			
AIDS	43	6	18	3	8	8	249	304	348
Campylobacteriosis	47	8	18	5	7	9	208	221	238
Chickenpox	186	42	84	17	23	20	998	217	330
***E. coli,* Shiga toxin-producing**	10	6	3	0	1	0	49	27	18
Giardiasis	28	3	18	3	2	2	191	238	168
Gonorrhea	737	48	25	114	270	280	3,247	4,061	4,465
Group A Strep, Invasive	16	3	5	2	4	2	83	48	54
Hepatitis, Viral									
A	2	1	1	0	0	0	24	43	48
B, acute	4	0	0	1	2	1	21	79	86
C, acute	2	1	0	0	1	0	3	8	4
HIV Infection	84	13	29	5	19	18	448	371	422
Lead in Children†	79	8	5	16	35	15	274	229	282
Legionellosis	9	1	2	2	1	3	23	16	10
Lyme Disease	27	2	14	3	1	7	44	50	34
Measles	0	0	0	0	0	0	0	0	0
Meningococcal Infection	2	1	1	0	0	0	13	17	19
Pertussis	14	2	6	1	1	4	100	125	71
Rabies in Animals	42	17	5	10	5	5	301	256	244
Rocky Mountain Spotted Fever	7	0	1	1	3	2	21	10	5
Rubella	0	0	0	0	0	0	0	0	0
Salmonellosis	45	2	17	6	11	9	293	372	382
Shigellosis	5	0	3	0	1	1	27	47	167
Syphilis, Early§	22	1	11	3	2	5	147	128	108
Tuberculosis	48	8	25	0	7	8	133	137	117

Localities Reporting Animal Rabies This Month: Accomack 2 raccoons; Albemarle 2 raccoons; Amelia 1 skunk; Augusta 1 fox; Botetourt 1 fox; Carroll 1 fox, 2 raccoons; Charlotte 1 skunk; Clarke 2 raccoons; Fairfax 1 bat, 1 fox, 2 raccoons; Fauquier 1 fox, 2 raccoons; Frederick 1 bat; Gloucester 1 fox; Hanover 1 raccoon; Henry 1 raccoon; Highland 1 raccoon; Montgomery 1 raccoon; Northampton 1 raccoon; Page 1 fox; Pittsylvania 1 raccoon; Powhatan 2 raccoons; Prince William 1 skunk; Pulaski 1 fox; Rockbridge 1 raccoon, 1 skunk; Rockingham 1 fox, 1 skunk; Shenandoah 1 fox; Southampton 1 skunk; Spotsylvania 1 cat; Wythe 1 cat, 1 skunk.

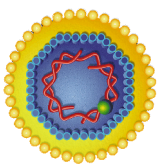
Toxic Substance-related Illnesses: Adult Lead Exposure 20; Mercury Exposure 1; Mesothelioma 2; Pneumoconiosis 6.

*Data for 2006 are provisional. †Elevated blood lead levels ≥10µg/dL. §Includes primary, secondary, and early latent.

Continuing Medical Education: Viral Hepatitis Serology

Viral hepatitis is inflammation of the liver caused by a virus. Since the signs and symptoms of viral hepatitis cannot distinguish the causative agent, laboratory testing is a critical component to patient evaluation. However, interpreting serologic results can take some practice.

To aid healthcare professionals in better understanding the results of serology testing for viral hepatitis, the Centers for Disease Control and Prevention (CDC) has developed an on-line course. The course, made up of six animated tutorials with voiceovers and case studies, is available at www.cdc.gov/ncidod/diseases/hepatitis/serology/index.htm.



The CDC provides continuing education (e.g., a maximum of 1.3 hours in category 1 credit toward the AMA Physician's Recognition Award) for completion of this educational activity.