and poultry (turkeys and ducks) are most frequently involved in transmission of *C. psittaci* to humans. Exposure is greatest among poultry-processing workers and owners of pet birds. Infectious forms of the organisms are shed from both symptomatic and apparently healthy birds and may remain viable for several months. *C. psittaci* can be transmitted to humans by direct contact with infected birds or by inhalation of aerosols from avian nasal discharges and from infectious avian fecal or feather dust. Transmission from person to person has never been demonstrated.

The diagnosis is usually established serologically. Psittacosis in humans may present as acute primary atypical pneumonia (which can be fatal in up to 10% of untreated cases); as severe chronic pneumonia; or as a mild illness or asymptomatic infection in persons exposed to infected birds.

EPIDEMIOLOGY

Fewer than 50 confirmed cases of psittacosis are reported in the United States each year, although many more cases probably occur than are reported. Control of psittacosis depends on control of avian sources of infection. A pandemic of psittacosis was once stopped by banning shipment or importation of psittacine birds. Birds can receive prophylaxis in the form of a tetracycline-containing feed. Imported birds are currently quarantined for 30 days of treatment.

CLINICAL MANIFESTATIONS

Typical symptoms include fever, chills, muscular aches and pains, severe headache, hepato- and/or splenomegaly, and gastrointestinal symptoms. Cardiac complications may involve endocarditis and myocarditis. Fatal cases were common in the preantibiotic era. As a result of quarantine of imported birds and improved veterinary-hygienic measures, outbreaks and sporadic cases of psittacosis are now rare. Severe pneumonia requiring management in an intensive care unit may develop. Endocarditis, hepatitis, and neurologic complications may occur, and fatal cases have been reported. The incubation period is usually 5–19 days but can last as long as 28 days.

DIAGNOSIS

Previously, the most widely used serologic test for diagnosing chlamydial infections was the genus-specific CF test, in which assay of paired serum specimens often shows fourfold or greater increases in antibody titer. The CF test remains useful, but the gold standard of serologic tests is now the MIF test, which is not widely available (see section on diagnosis of *C. trachomatis* genital infection, above). Any antibody titer above 1:16 is considered significant evidence of exposure to chlamydiae, and a fourfold titer rise in paired sera in combination with a clinically compatible syndrome can be used to diagnose psittacosis. Some commercially available serologic tests based on measurement of antibodies to LPS can be useful when the clinical diagnosis is consistent with bird exposure; however, since these tests are reactive for all chlamydiae (i.e., all chlamydiae contain LPS), caution must be used in their interpretation.

TREATMENT PSITTACOSIS

The antibiotic of choice is tetracycline; the dosage for adults is 250 mg four times a day, continued for at least 3 weeks to avoid relapse. Severely ill patients may need cardiovascular and respiratory support. Erythromycin (500 mg four times a day by mouth) is an alternative therapy.

CHLAMYDIA PNEUMONIAE INFECTIONS

C. pneumoniae is a common cause of human respiratory diseases, such as pneumonia and bronchitis. This organism has been reported to account for as many as 10% of cases of community-acquired pneumonia, most of which are diagnosed by serology. Serologic studies have linked *C. pneumoniae* to atherosclerosis; isolation and PCR detection in cardiovascular tissues have also been reported. These findings suggest an expanded range of diseases and syndromes for *C. pneumoniae.* The role of *C. pneumoniae* in the etiology of atherosclerosis has been discussed since 1988, when Finnish researchers presented serologic evidence of an association of this organism with coronary heart disease and acute myocardial infarction. Subsequently, the organism was identified in atherosclerotic lesions by culture, PCR, immunohistochemistry, and transmission electron microscopy; however, discrepant study results (including those of animal studies) and failure of large-scale treatment studies have raised doubts as to the etiologic role of *C. pneumoniae* in atherosclerosis. Large-scale case-cohort studies have demonstrated some association of *C. pneumoniae* with lung cancer, as evaluated by serology.

EPIDEMIOLOGY

Primary infection occurs mainly in school-aged children and reinfection in adults. Seroprevalence rates of 40–70% show that *C. pneumoniae* is widespread in both industrialized and developing countries. Seropositivity usually is first detected at school age, and rates generally increase by ~10% per decade. About 50% of individuals have detectable antibody at 30 years of age, and most have detectable antibody by the eighth decade of life. Although serologic evidence suggests that *C. pneumoniae* may be associated with up to 10% of cases of community-acquired pneumonia, most of this evidence is based not on paired serum samples but rather on a single high IgG titer. Some doubt exists about the true prevalence and etiologic role of *C. pneumoniae* in atypical pneumonia, especially since reports of cross-reactivity have raised questions about the specificity of serology when only a single serum sample is used for diagnosis.

PATHOGENESIS

Little is known about the pathogenesis of *C. pneumoniae* infection. It begins in the upper respiratory tract and, in many persons, persists as a prolonged asymptomatic condition of the upper respiratory mucosal surfaces. However, evidence of replication within vascular endothelium and synovial membranes of joints shows that, in at least some individuals, the organism is transported to distant sites, perhaps within macrophages. A *C. pneumoniae* outer-membrane protein may induce host immune responses whose cross-reactivity with human proteins results in an autoimmune reaction.

As mentioned above, epidemiologic studies have demonstrated an association between serologic evidence of *C. pneumoniae* infection and atherosclerotic disease of the coronary and other arteries. In addition, *C. pneumoniae* has been identified in atherosclerotic plaques by electron microscopy, DNA hybridization, and immunocytochemistry. The organism has been recovered in culture from atheromatous plaque—a result indicating the presence of viable replicating bacteria in vessels. Evidence from animal models supports the hypothesis that *C. pneumoniae* infection of the upper respiratory tract is followed by recovery of the organism from atheromatous lesions in the aorta and that the infection accelerates the process of atherosclerosis, especially in hypercholesterolemic animals. Antimicrobial treatment of the infected animals reverses the increased risk of atherosclerosis. In humans, two small trials in patients with unstable angina or recent myocardial infarction suggested that antibiotics reduce the likelihood of subsequent untoward cardiac events. However, larger-scale trials have not documented an effect of various antichlamydial regimens on the risk of these events.

CLINICAL MANIFESTATIONS

C. pneumoniae was first reported as the etiologic agent of mild atypical pneumonia in military recruits and college students. The clinical spectrum of *C. pneumoniae* infection includes acute pharyngitis, sinusitis, bronchitis, and pneumonitis, primarily in young adults. The clinical manifestations of primary infection appear to be more severe