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**Research Article**

# PATHOGENS CAUSING LOWER RESPIRATORY TRACT INFECTIONS

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**A B S T R A C T**

"Delays have dangerous ends"Most of the bacteria, viruses, fungal, protozoan parasites and helminth larvae are responsible in causing lower respiratory tract infections. Pneumonia is often divided in to "Typical" pneumonia caused by pyogenic bacteria. "Atypical" pneumonia is caused by organisms such as Mycoplasma pneumonia, Chlamydia pneumonia and Legionella pneumonia.A typical pneumonia exhibit a non-lobar, patchy,ill-defined on chest radiography and failure to show a causative organism on Gram stain or culture of sputum as routinely performed.(1)Streptococcus pneumonia is the most common cause of death in aged. Haemophilus is especially in elders and immunocompromised. Staph. aureus in intravenous drug users. Human para influenza, mainly in infants and children.RSV in young children. Robert Koch identified Mycobacterium tuberculosis as the causal agent of TB (tuberculosis) At present TB is the global health problem.Bovine tuberculosis is caused by M. bovis in cows and catties (2) It is equally dangerous. M. bovis spreads to humans through contaminated milk.



## INTRODUCTION

The recent advances in next-generation sequencing and comparative genomics have enabled the development of robust and reliable molecular methods for the detection and identification of *S. pneumonia e*. For instance, the *Xisco* gene was recently described as a bio marker for PCR-based detection of *S. pneumonia e* and differentiation from closely related species.(3)

Sometimes the tubercle lesions liquefy and form air-filled cavities where bacteria can spread new foci of infections throughout the body. Streptococcal Pneumonia Most common cause of pneumonia. Leading cause of death in aged and those with impaired resistance A prior viral infection (For eg. with influenzae virus) that causes increased volume of the viscosity of bronchial secretions and inhibition of the bronchial cilia predisposes the patient to secondary infection by Streptococcus pneumonia.(4).

Therefore, streptococcal pneumonia is considered an endogenous infection. S. pneumonia e is a Gram-positive bacterium containing a capsule of the polysaccharide. (5).

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Move over, about 60 to 80% of all respiratory diseases known so far is caused by this bacterium. (6). This also inhibits the binding of antibodies to the cell; thus it inhibits phagocytosis (7). The persons, sensitive to penicillin, can take erythromycin or tetracycline. For debilitated persons, a pneumococcal vaccine (Pneumovax) is also available.

Mycobacterium is rod-shaped and acid fast stain. Therefore, the cells take red stain. The bacterium infects the respiratory tract and established in lung tissues (8). The symptoms include a cough, pain in chest, fever and secretion called sputum. The sputum appears red or rust-colored if mixed with blood in the lung cavity. Bacteria remain alive in macrophages (9) Invasive Aspergillosis is distinguished by setting in immunocompromised persons and its rapid progression to death.. Fever dry cough may be the only signs until pulmonary infiltrates are demonstrated radiographically. Until Aspergillus hyphae are demonstrated almost any of the causes of pneumonia could be responsible.(11) Pneumocystis pneumonia is insiduous,begining with mild fever or malaise in persons whose immune system is copromised. Signs referable to the lung come later with non productive cough and shortness of breath. Radiographs reveal symmetric alveolar pulmonary infiltrates. Progressive cyonosis, hypoxia and asphyxia can lead to death in a 3-4 week period.(12). In Mycobacterium tuberculosis, the cener of the tubercle develops a charecteristic expanding, casious,cheesy necrosis (13)Klebsiella pneumonia

is a serious disease with high case of fatality. It occrs in middle aged and older persons who have medical problems such as alcoholism, chronic broncho pulmonary disease or diabetic mellitus. (14). Legionella pneumophilia disease was charecterized by fever, cough and chest pain leading to pneumonia and often ending fatality (15)Histoplasma capsulatum leads to pumonary infection. Milary lesions appear and become enlarged. With healing the pulmonary lesions become fibrotic and calcified(16). Type b H.influenza causes meningitis, pneumonia and empyma and occasionally the forms of invasive infection. (17) Respiratory synstial virus replication occurs initially in epithelial cells of the nasopharynx.(18). Bronchopulmonary Aspergillos is characterized by high eosinophilia(19)A. fumigatus produce endotoxins are involved in hemorrhagic lesions produced in birds and animals (20). Precipitins could be demonstrated in the blood sera of previously inoculated rabbits. Immune serum of rabbit has prevented the effect of toxins in experimental animals (21). It is thought that the virus originated in the Guangdong province in southern China, with neighboring Hong Kong being one of the main centers of the outbreak (22) The respiratory syncytial virus**,** Major viral respiratory tract pathogen in the pediatric population and the most important cause of bronchiolitis and pneumonia in infants under one year of age. Also causes atypical pneumonia in young childrenIt causes necrosis of epithelial cells in the alveoli, bronchioles and bronchi. Mucus, dead cells and fibrin clog the air way.. Both influenza A and B viruses have two distinct surface antigens–the Hemagglutinin (H) and the Neuraminidase (N) antigens (23)Adenovirus spread through sneezing, coughing.Produce bronchitis,croup (Barking cough,) High pitch sound,trouble breathing.It is common in infants and children.The respiratory syndrome may progress to true viral pneumonia Adenoviruses replicate well in epithelial cells. the replicate infection resulting in cell death.. Mycoplasma, are the small prokaryotic organisms with no peptidoglycon cell wall. Causes Atypical pneumonia, Milder bronchitis, pharyngitis Because lack of cell wall, Mycoplasma are insensitive to antibiotics. It produces pharyngitis, laryngitis, bronchitis or interstitial pneumonia. Legionella pneumophilia Intracellular Gram negative rods. Infection generally result from inhalation of contaminated aerosol from air conditioners and air coolers. No human to human.Extensive bronchopneumonia to lobar pneumonia .Replicate in cells of the monocyte macro phase system in the alveolar causing a necrotizing, multi focal pneumonia..

***History***

*M. tuberculosis*, then known as the "tubercle bacillus". The bacterium is also known as "Koch's bacillus".(24)

Tuberculosis has existed throughout history, but the name has changed frequently over time.(25).

Pneumonia has been a common disease throughout human history. The symptoms were described by Hippocrates (c. 460 BC – 370 BC) (26) *Chlamydophila pneumoniae* is a species of *Chlamydophila*, an obligate intracellular bacterium that infects humans and is a major cause of pneumonia (27).It was known as the Taiwan acute respiratory agent (TWAR) from the names of the two original isolates – Taiwan (TW-183) and an acute respiratory isolate designated AR-39.(28) *Legionella* epidemic among U.S. war veterans, occurring in the same city as-and within days of the 200th anniversary of-the signing of the Declaration of Independence, was widely publicized and caused great concern in the United States. (29)

The CDC and Canada's National Microbiology Laboratory identified the SARS genome in April, 2003.(30) Scientists at Erasmus University in Rotterdam, the Netherlands demonstrated that the SARS coronavirus fulfilled Koch's postulates thereby confirming it as the causative agent.(31)In the experiments, macaques infected with the virus developed the same symptoms as human SARS victims. (32) S. neumonia In 1881, the organism, known later in 1886 as the pneumococcus (33) for its role as a cause of pneumonia, was first isolated simultaneously and independently by the U.S. Army physician George Sternberg (34)and the French chemist Louis Pasteur. (35)

***Major Advances and Discoveries***

The subcutaneous mycoses are not transmissible from human to human under ordinary conditions. The wide range of clinical manifestations of histoplasmosis makes it a peculiarly complex disease, often resembling tuberculosis (36) Coccidioides immitis is endemic in South Western United States, California, Texas, Mexico Arid soil in and around rodent burrows is a common reservoir for hyphae and arthoconidia. Infection results from inhalation of arthroconidia. Non-immune individuals visiting endemic area can develop this infection after overwhelming inhalation exposure.

***Where the Research Go Next?***

Fungal infections represent approximately fifteen percent of all nosocomial infections in intensive care units in United States with Candida species being the most commonly occurring fungal pathogen.In AIDS patients, cryptococcosis, is the second most common fungal infection after candidiasis, is potentially more serious.Because the mechanism of action of anti fungal drugs, such as amphotericin, involves interfering with ergosterol synthesis or function, these drugs are useless or ergosterol-lacking fungi. Candida albicans produce systemic or superficial infection. It produce oral or esophageal thrush in immuno compromised (neonates, steroids, drugs, Diabetes, AIDS), vulvo vaginitis (diabetics, use of anti bio tics),diaper rash, endocarditis in intra venous drug users, disseminated candidiasis (to any organ), Tropical azole for vaginal, Fluconazole for oral Fluconazole and Amphoteticin B for systemic. Aspergellus produce lung cavities especially after TB infection.It also produce allergic bronchi pulmonary aspergillosis (ABPA) with asthma.Some species of aspergellosis produce afflotoxins.

It is thought that the virus originated in the Guangdong province in southern China, with neighbouring Hong Kong being one of the main centres of the outbreak (22).

***Current Debate***

The TRS (transcription regulatory sequences) circuit regulates efficient expression of SARS-CoV subgenomic mRNAs. The wild type TRS is ACGAAC.

Adenovirus Antigen detection, polymerase chain reaction assay, virus isolation, and serology can be used to identify adenovirus infections. Adenovirus typing is usually accomplished by hemagglutination-inhibition and/or neutralization with type-specific antisera. Since adenovirus can be excreted for prolonged periods, the presence of virus does

not necessarily mean it is associated with disease. (37) *M.pneumonia,* Causative diagnosis is dependent upon laboratory testing, however these methods are more practical in epidemiological studies than in patient diagnosis.Culture tests are rarely used as diagnosic tools; rather immunoblotting, immunofluorescent staining, hemadsorption tests, tetrazolium reduction, metabolic inhibition tests, serological assays, and polymerase chain reaction (PCR) are used for diagnosis and characterization of bacterial pneumonic infections, (38)

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