

(A) Percentage (%) of patients who met the primary outcome in each group; (B) Mean %FEV1 change between ceftaroline (square) and vancomycin (circle) with error bars representing standard deviations

Conclusion. This study found no difference in safety and efficacy outcomes between vancomycin and ceftaroline. Our small cohort supports ceftaroline as an alternative agent for the treatment of MRSA mediated APE of CF.

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1316. Uncommon Presentations of Common Variable Immunodeficiency

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Session: P-73. Respiratory Infections - Bacterial

Background. Common Variable Immunodeficiency (CVID) is a primary immunodeficiency disorder which affects B lymphocyte function and differentiation causing decreased levels of Immunoglobulin G (IgG), Immunoglobulin A (IgA) and Immunoglobulin M (IgM).¹ The objective of this study is to highlight how hypogammaglobulinemia can lead to respiratory infections with microbes that are lesser known in the background of CVID with the help of a two-case series.

Methods. Medical records of two patients with CVID were reviewed who were found to have mycobacterium avium-complex intracellulare and streptococcus agalactiae lung infections respectively.

Results. Decreased IgG in CVID means reduced antibody production, low IgA leads to mucosal inflammation and increased susceptibility to respiratory infections² and lower IgM memory B-cells causes infections with encapsulated microorganisms.³ Table 1 highlights the various respiratory infections and their etiologies that have been reported with CVID, the most common being encapsulated organisms like Haemophilus influenza, Streptococcus pneumonia, Neisseria meningitidis along with enterovirus. Table 2 demonstrates our findings. In the first case we have reported a patient with mycobacterium avium-complex intracellulare (MAC-I). This could be because of hypogammaglobulinemia, decreased B and T-cell interaction and reduced T-cell signaling caused by CVID.⁴ Although, mycobacterium tuberculosis, simiae and hominis lung infections and mycobacterium bovis systemic infections have been reported before, MAC-I is relatively rare in CVID.⁵ In our second case, the patient developed streptococcus agalactiae or Group-B streptococcus (GBS) empyema. Most cases of GBS have been reported in pregnant women and infants. Infections with other encapsulated organisms have been reported in CVID but GBS empyema is less frequent and can happen due to decreased bacteria-specific CD4 cells, microbial translocation and hypogammaglobulinemia.⁶

Table 1. Respiratory Infections reported in CVID along with their etiologies.

References: 2-21.

Study	Infection	Etiology
Janeway et al	Sinusitis, pneumonia	Haemophilus influenza
Cunningham-Rundles	Recurrent bacterial infections including tonsillitis Bronchiectasis Pneumonia Empyema	Streptococcus pneumoniae Metapneumovirus
Kokron et al	Lung Infection	Mycobacterium tuberculosis
Arora et al	Lung Infection	Mycobacterium simiae
Antachopoulos et al	Colonization and infestation	Aspergillus species Histoplasma capsulatum
Oksenhendler et al	Bronchitis	Multiple
Berbers et al	Structural airway disease Interstitial lung disease	Prevotella Alloprevotella Selenomonas Streptococcus
Cohen et al	Pneumonia	COVID-19
Rushchel et al	Pneumonia	Moraxella catarrhalis Staphylococcus aureus Pneumocystis jirovecii Mycoplasma pneumoniae
Więsik-Szewczyk et al		Chlamydia pneumoniae
Kralickova et al	Pneumonia	Cytomegalovirus Atypical mycobacteria
Kellner et al	Lung infection	Candida albicans Cryptococcus neoformans Herpes simplex virus Varicella Zoster virus Ebstein Barr virus Pseudomonas aeruginosa
Tam et al	Pneumonia	Ureaplasma urealyticum
Yazdani et al	Pneumonia Otitis media Rhino sinusitis Pharyngitis Laryngitis Epiglottitis	Bordetella pertussis Neisseria meningitidis Mycobacterium hominis Adenovirus Enterovirus Human herpes virus 8
Aydogan et al	Bronchiectasis	Proteus mirabilis Serratia marcescens
Urschel et al	Pneumonia	Measles
Baumann et al	Upper respiratory tract Infection	Rhinovirus

Table 1: Case Presentations

	Case 1	Case 2
Age (in years)	61	39
Gender	Female	Female
Chief complaints	Cough, hemoptysis, shortness of breath, night sweats, significant weight loss and intermittent fever	Fever, cough and pleuritic chest pain
Associated disorder and treatment received	CVID with intravenous immunoglobulin (IVIg) therapy	CVID with allogeneic stem cell transplant and associated graft-versus-host disease.
Associated Malignancies and treatment received	Stage three ovarian cancer treated with surgery and chemotherapy.	Acute Myeloid Leukemia (AML) treated with chemotherapy.
Infectious history	No significant history.	Multiple infections in the past with methicillin-sensitive and resistant staphylococcus aureus, pseudomonas aeruginosa, coagulase-negative staphylococcus, clostridium difficile, vancomycin-resistant enterococcus, E. coli, parainfluenza-3, influenza, herpes simplex and aspergillus species, in the form of cellulitis, sinusitis, panniculitis, colitis, meningitis, bronchitis, urinary tract infections, pneumonia, mucositis and simple colonization over several years. More recently she developed empyema of the right lower lobe with cultures positive for streptococcus agalactiae which required decortication, lobectomy and a prolonged course of intravenous antibiotics.
Other relevant history	History of bronchiectasis.	Multiple drug allergies, past surgical history of tonsillectomy, family history of hypogammaglobulinemia.
Examination findings	Mild expiratory wheezing noted more on the left side than the right	A temperature of 101.F was found on admission but remained normal thereafter.
Laboratory findings	Negative blood cultures. Bronchoalveolar lavage demonstrated mycobacterium avium-intracellulare complex.	Respiratory viral panels and blood cultures were negative.
Radiology findings	Computed tomography (CT) scan of the chest showed a 2.1 cm left hilar nodular mass encasing the lingular bronchus, associated with mucus plugging and bilateral hilar lymphadenopathy. (Figure 1)	A CT scan of the chest revealed a decreased fluid collection in the lower thorax and diminished parenchymal consolidation compared to previous scans.
Final diagnosis	Mycobacterium avium-complex intracellular infection with CVID.	Findings were consistent with improving Streptococcus agalactiae empyema status with CVID.
Management	Symptoms were well-controlled during the hospital stay, patient was monitored with serial CT scans and responded well to symptomatic management.	Due to lack of any active infections, the patient did not require antibiotic therapy and was discharged home in stable condition with orders of regular follow up.

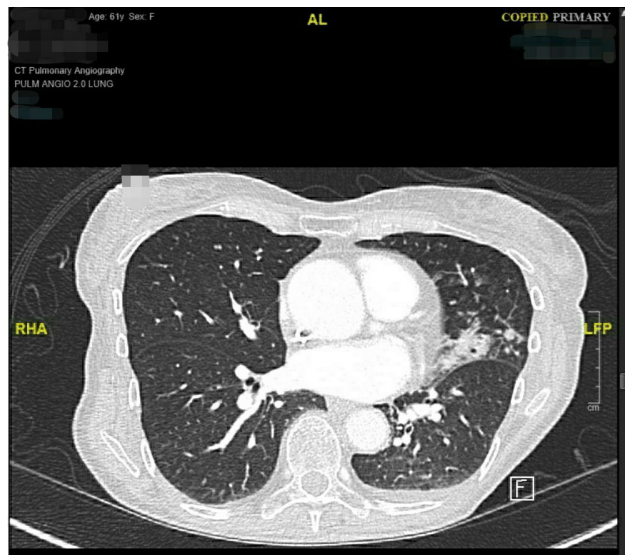


Figure 1. CT image of MAC-I infection.

Conclusion. We encountered two unique cases of CVID with rare infectious etiologies. The cases are intended to create an awareness and vigilance regarding CVID induced hypogammaglobulinemia which can cause respiratory infections with lesser known pathogens where antibodies may be important.

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1317. Prevalence of *Pseudomonas aeruginosa* as the Causative Organism for Community Acquired Pneumonia

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Session: P-73. Respiratory Infections - Bacterial

Background. IDSA/ATS guidelines regarding pneumonia diagnosis and treatment changed in 2019. Guidelines recommend determining local prevalence of MRSA and *P. aeruginosa* to help guide empiric antibiotic coverage. The aim of our study was to determine the prevalence of *P. aeruginosa* as the causative organism for adult patients admitted to a large urban academic medical center with community acquired pneumonia (CAP).

Methods. A report of urine streptococcus antigen tests collected January 1st-December 31st in 2019 was generated. Six hundred charts were reviewed and two hundred subjects met inclusion criteria (figure 1). Inclusion criteria were age >18, hospital admission, and documented suspicion of pneumonia by physician.

Results. The average age was 70 and half of the cases were women. The causative organism was identified in 60/200 cases (table 1). No cases of *P. aeruginosa* were identified. The most commonly isolated organisms were Influenza A and pneumococcus. 66% of cases had age >65yo, 25% were from long term care facilities, 34% had structural lung disease, 20% had dementia, 15% were hospitalized in the prior 90 days and received IV antibiotics, and 30% of cases met severe CAP criteria (table 2).

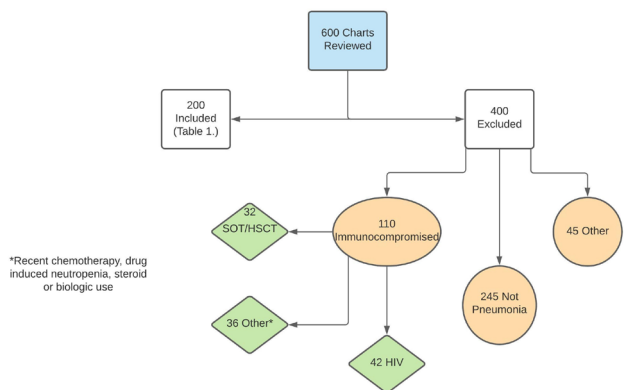


Figure 1. Workflow

Table 1. Organisms Identified

Organism	Frequency n=60
Influenza A	13
Pneumococcus	11
RSV	6
hMPV	5
MSSA	5
MRSA	3
Other GNB (<i>Klebsiella</i> , <i>E. coli</i>)	4
Legionella	3
Other Virus (Coronavirus, Rhinovirus, Parainfluenza)	5
Co-Infection (i.e. Influenza A + Pneumococcus)	5

Table 2. Risk Factors

Risk Factor	Frequency (%) n=200
Age >65yo	132 (66)
Hx of Smoking	96 (48)
Presence of Enteric Feeding Tube	12 (6)
Hx of Dementia	41 (20.5)
Hemodialysis	4 (2)
Structural Lung Disease (COPD, Cavitations, IPF, Bronchiectasis)	68 (34)
Hospitalization within prior 90 days with IV abx	31 (15.5)
From Long Term Care Facility	50 (25)
Severe CAP Criteria Met (IDSA 2007)	59 (29.5)
<i>Pseudomonas</i> in Respiratory or Blood Culture within One Year	1 (.05)

Conclusion. Limitations include a low prevalence of renal failure in the study population, and lack of a standardized respiratory infection evaluation. Our results suggest that empiric coverage for *P. aeruginosa* may not be needed at our center in this cohort of older patients with clinical characteristics sometimes thought to be risk factors for *P. aeruginosa*.

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1318. Clinical and Molecular Characteristics of Hypermucoviscous *Klebsiella pneumoniae* Causing Pneumonia in Korea

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Session: P-73. Respiratory Infections - Bacterial

Background. Invasive *Klebsiella pneumoniae* (*K. pneumoniae*) was emerged in Asia, well-known for community-onset liver abscess. Healthcare-associated pneumonia caused by hypervirulent *K. pneumoniae* has been reported in recent studies. The purpose of this study was to evaluate the clinical and molecular characteristics of hypervirulent *K. pneumoniae* compared with classic *K. pneumoniae* in respiratory infection.

Methods. The study was performed on 163 *K. pneumoniae* isolates of respiratory infections collected from Keimyung University of Dongsan Medical Center from November 2013 to November 2015; group A, as classic *K. pneumoniae* and group B, as hypervirulent *K. pneumoniae*. Hypermucoviscous phenotype was confirmed with string test. Capsular serotypes, *rmpA*, *magA*, *allS*, *mrkD*, *entB*, *kfu*, and *iutA* were identified using specific primers by polymerase chain reaction. The biofilm mass was determined using the microtiter plate assay measured by optical density (OD, 570nm).

Results. A total 163 patients were analyzed, 100 (61.3%) of group A and 68 (38.7%) of group B. Community-acquired pneumonia was observed in 49.2% of group B and 18.0% of group A ($p=0.001$). Underlying diseases except chronic lung disease were more associated with group A. Mean age (72.6±11.7 vs. 68.8±12.5 years,