HAP is life threatening, appropriate diagnosis and treatment are required; however, large-scale Japanese data focusing on patient profiles and treatment patterns is lacking.

**Methods.** The demographics and treatment patterns of HAP were examined using a large-scale Japanese claims database from Jan. 2016 to Apr. 2018. The HAP population included patients who received injection antibiotics ≥3 consecutive days after admission, but not within 2 days after admission, and those whose reason for hospitalization was not pneumonia but had a diagnosis of pneumonia after hospitalization (based on ICD-10 codes).

**Results.** 2,968 HAP patients (mean age 77 years, 64.9% male) contributing 2,979 episodes were included. The 12-month pre-index mean Charlson Comorbidity Index (CCI) score was 4.0±3.1 (mean±SD). CCI scores ≤4 comprised 44.0%. Most HAP episodes (77.6%) occurred ≥2 days after hospitalization. During the 12-month pre-index period including outpatients, 84.9% of patients had some type of pneumonia record, 9.1% had VAP (ventilator associated pneumonia) records, and 7.4% had anti-MRSA prescription records. For post-index HAP treatment, ampicillin/sulbactam (36.4%, 8.2±3.8 days), and piperacillin/tazobactam (22.0%, 8.8±6.4 days) were frequently prescribed as the first antibiotic prescription. Ceftaroline (19.4%) and meropenem (9.8%) were also frequently prescribed. Examinations prescribed during HAP, 30.5% blood culture tests, 28.2% sputum examinations and 29.2% urine antigen tests. The overall mortality rate of HAP in overall hospitalization post-index was 22.0%, in which 14.4% of deaths occurred within 30 days. The mean (±SD) length of overall hospital stay was 49.9 (±34.2) days (11.3 days for HAP period), with 12.4% ICU use and 17.6% ventilator use. The median total cost during hospitalization was ¥1,924,848.18 ($19,248).

**Conclusion.** The data revealed patient characteristics, treatment patterns, mortality rates and healthcare costs in Japanese HAP patients. This database approach should prove useful for discussing antibiotics usage trends in highly aging Japan.

**Disclosures.** Masahiro Kimata, PhD, MSK K.K., Tokyo, Japan (Employee); Yosuke Aoki, MD, PhD, MSDK K.K., Tokyo, Japan (Other Financial or Material Support, Honorarium for Lecturing, EviMed Research Group, LLC, Goshen, MA; Merck & Co., Inc., Kenilworth, New Jersey, EviMed Research Group, LLC & University of Massachusetts, Amherst, Amherst, Massachusetts; Medstar Washington Hospital Center, Washington, DC)

Session: P-73. Respiratory Infections - Bacterial

**Background.** Nosocomial pneumonia (NP) is associated with excess morbidity and mortality. The effect of NP on other measures of outcome and quality, such as re-admission at 30 days, remains unclear. Moreover, differing types of NP may have varying impacts on re-admissions.

**Methods.** We conducted a multicenter retrospective cohort study within the Premier Research database, a source containing administrative, pharmacy, and microbiology data. The rate of rehospitalization at 30 days following the index discharge served as our primary endpoint. We compared NP patients readmitted with pneumonia as the principal diagnosis to those readmitted for other reasons (RaO).

We also compared rehospitalization rates as function of the type of NP: ventilator-associated bacterial pneumonia (VABP), ventilated hospital-acquired bacterial pneumonia (vHABP), and non-ventilated HABP (nvHABP).

**Results.** Among 17,819 patients with NP, 14,123 (79.3%) survived to discharge, of whom 6,165 (43.0%) were RaP, and the remainder were RaO. At index hospitalization, RaP patients were older (mean age (SD) 76.4 (13.9) vs. 65.0 (15.2) years), more likely to be admitted to ICUs (51.0% vs. 46.2%), and were more likely to have VAP (ventilator associated pneumonia) (39.9% vs. 28.3%), ventilated hospital-acquired bacterial pneumonia (34.0% vs. 21.8%), and hospital-acquired bacterial pneumonia (21.8% vs. 15.3%). Most HAP (47.2%) occurred in RaP, and 38.1% in RaO. Other HAP causes were similar between the two groups, including ventilated hospital-acquired pneumonia (33.3% vs. 32.6%), ventilated ventilator-acquired pneumonia (9.5% vs. 9.2%), and non-ventilated ventilator-acquired pneumonia (4.5% vs. 4.2%).

Of these, 106 (4.9%) were RaP, and the remainder were RaO. At index hospitalization, RaP patients were older (mean age (SD) 76.4 (13.9) vs. 65.0 (15.2) years), more likely to be admitted to ICUs (51.0% vs. 46.2%), and were more likely to have VAP (ventilator associated pneumonia) (39.9% vs. 28.3%), ventilated hospital-acquired bacterial pneumonia (34.0% vs. 21.8%), and hospital-acquired bacterial pneumonia (21.8% vs. 15.3%). Most HAP (47.2%) occurred in RaP, and 38.1% in RaO. Other HAP causes were similar between the two groups, including ventilated hospital-acquired pneumonia (33.3% vs. 32.6%), ventilated ventilator-acquired pneumonia (9.5% vs. 9.2%), and non-ventilated ventilator-acquired pneumonia (4.5% vs. 4.2%).

One in seven survivors of a hospitalization complicated by NP requires rehospitalization at 30 days. The mean (±SD) length of overall hospital stay was 49.9 (±34.2) days (11.3 days for HAP period), with 12.4% ICU use and 17.6% ventilator use. The median total cost during hospitalization was ¥1,924,848.18 ($19,248).

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(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 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). 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 infections and lower IgM memory B-cells causes infections with encapsulated microorganisms. Table 1 highlights the various respiratory infections and their etiologies that have been reported with CVID, the most common being encapsulated organisms like Haemophilus influenzae, 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. Although, mycobacterium tuberculosis, simiae and hominis lung infections and mycobacterium bovis systemic infections have been reported before, MAC-I is relatively rare in CVID. 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.

**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.

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

| Study | Infection | Etiology |
|-------|-----------|----------|
| Jenevy et al | Sinusitis, pneumonia | Haemophilus influenza |
| Cunningham-Rundles | Recurrent bacterial infections | Streptococcus pneumonia, Neisseria meningitidis |
| Kokoon et al | Lung infection | Mycobacterium tuberculosis |
| Arora et al | Lung infection | Mycobacterium simiae |
| Antalasinghie et al | Colonization and infection | Aspergillus species, Histoplasma capsulatum |
| Okonkwo et al | Bronchitis | Multiple |
| Birbers et al | Structural airway disease | Proteus mirabilis, Salmomanna, Streptococcus |
| Cohen et al | Pneumonia | COVID-19 |
| Bushel et al | Pneumonia | Moraxella catarrhalis, Staphylococcus aureus, Pseudomonas aeruginosa, Mycoplasma pneumoniae |
| Wyswik-Szczapcz et al | Pneumonia | Chlamydia pneumoniae |
| Kridicova et al | Pneumonia | Cytomegalovirus, Atypical mycobacteria |
| Kelher et al | Lung infection | Candida albicans, Cryptococcus neoformans, Herpes simplex virus, Varicella Zoster virus, EBV, HIV, Pneumocystis jiroveci, Mycobacterium hominis, Adenovirus, Enterovirus, Human herpes virus 8 |
| Tam et al | Pneumonia | Ureaplasma urealyticum |
| Yazdani et al | Pneumonia | Bordetella pertussis, Neisseria meningitidis |
| Aylagin et al | Bronchitis | Proteus mirabilis, Serratia marcescens |
| Urschel et al | Pneumonia | Molds |
| Blummann et al | Upper respiratory tract infection | Rhinovirus |

Table 2: Case Presentations

| Case 1 | Case 2 |
|--------|--------|
| Age (in years) | 81 | 29 |
| Gender | Female | Female |
| Chief complaints | Fever, cough and pleural chest pain | Cough, hemoptysis, shortness of breath, right chest, significant weight loss and intermittent fever |
| Associated disorder | CVD with intravenous immunoglobulin (IVIG) therapy | CVD with allogeneic stem cell transplant and associated graft-versus-host disease |
| Associated Maladies and treatment received | Stage three ovarian cancer treated with surgery and chemotherapy | Acute Myeloid Leukemia (AML) treated with chemotherapy |

Other relevant history | History of bronchiectasis, history of hypogammaglobulinemia |

Examination findings | Mild expiratory wheezing noted more on the left side than the right, A temperature of 38.5° was found on admission but remained normal thereafter |

Laboratory findings | Negative blood cultures, 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 muco-plugging and bilateral hilar lymphadenopathy, A CT scan of the chest revealed a decreased fluid collection in the lower lobe |

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 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.