Healthcare Resource Utilization for Medicare Patients with Non-Cystic Fibrosis Bronchiectasis (NCFB) and Exacerbations Coinfected with *Pseudomonas aeruginosa*

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BACKGROUND

- Non-Cystic Fibrosis Bronchiectasis (NCFB) is a chronic, progressive respiratory disorder characterized by irreversibly dilated airways, persistent cough, excessive sputum production, and recurrent pulmonary infections.[1]
- The bacterium *Pseudomonas aeruginosa (PsA)* is one of the most common and symptomatic pathogens associated with NCFB and is related to greater impairment on lung function, increased airway inflammation, more frequent and often severe exacerbations, decreased health related quality of life, greater risk of hospitalization and mortality.[2]
- NCFB exacerbations are defined by an increase in daily symptoms including cough, sputum production, malaise, fatigue, and breathing difficulties.[1]
- No curative treatments currently exist for NCFB patients with *PsA* and exacerbations.[3]
- The health resource utilization (HRU) burden for NCFB with *PsA* is not well characterized in the US.

OBJECTIVE

Quantify the HRU burden for NCFB patients with *PsA*, both chronically infected and with frequent acute exacerbations.

METHODOLOGY

This retrospective longitudinal study utilized the Medicare Limited Dataset (LDS) covering US Medicare enrolled patients aged ≥65 years.

STUDY POPULATION

This study included all patients who met the following criteria:

- Claims during the period of 1/01/2010 to 6/30/2021.
- At least one diagnosis for NCFB (International Classification of Diseases, 10th revision, clinical modification [ICD-10-CM] diagnosis code J47.XX or ICD-9-CM: 494.XX) identified as:
  - ≥1 inpatient or emergency department claim(s) for NCFB.
  - ≥2 outpatient NCFB claims in 365 days and ≥7 apart.
  - ≥1 outpatient NCFB claim(s) with bronchoscopy or CT scan ≥180 days and ≥7 prior.
- No diagnoses for cystic fibrosis (ICD-10-CM: E84. XX; ICD-9-CM: 277.XX).
- Observable for ≥1 year after the first NCFB diagnosis (index date).

STUDY COHORTS:

Of the patients identified with NCFB using the study criteria, additional inclusion and exclusion criteria were applied to capture NCFB patients with *PsA* and/or exacerbations as follows:

METHODOLOGY (Cont.)

NCFB Patients with *PsA* Coinfection

Patients who met one of two criteria 6 months before their NCFB diagnosis date or during the 12-month follow-up period:

- At least one non-ancillary claim for *PsA* infection (ICD-9: 041.7; ICD-10: B96.5).
- At least one non-ancillary claim for pneumonia due to *PsA* infection (ICD-9: 482.1; ICD-10: J15.1).

NCFB patients with exacerbations

Patients with NCFB who met one of four criteria:

- At least one hospitalization for NCFB.
- Receiving IV antibiotic treatment.
- ≥2 acute NCFB exacerbations within 12 months (ICD-9: 494.1; ICD-10: J47.1).
- Diagnosis for any kind of pneumonia.

RESULTS

Among 22,075 Medicare (≥65y) NCFB patients who met the study inclusion criteria, 824 (3.7%) had exacerbations with *PsA* (PsA^+), 10,870 (49.3%) had exacerbations without *PsA* (PsA^-), and 10,381 (47%) had neither *PsA* nor exacerbations (PsA^0). The average Charlson Comorbidity Index (CCI^4) score was 4.15±2.5, 3.74±2.5, and 2.87±2.2 for PsA^+, PsA^- and PsA^0, respectively (**Table 1**).

Table 1. Demographics and Charlson Comorbidity Index

Demographics	PsA^+ (n = 824)		PsA^- (n = 10,870)		PsA^0 (n = 10,381)	
Female (n, %)	432	52.4%	6,528	60.1%	6,487	62.5%
Age (Years, Mean±SD)	75.9	±7.4	77.1	±7.1	75.2	±7.0
Charlson Comorbidity Index (CCI^4)						
CCI Score (Mean±SD)	4.15	±2.5	3.74	±2.5	2.87	±2.2

- Average Inpatient (IP) Admissions per patient per year by category are summarized in **Figure 1**.
- Average IP Length of Stay (LOS) per patient per year by category are summarized in **Figure 2**.
- Average Outpatient (OP) encounters per patient per year by category are summarized in **Figure 3.**

Figure 1. Average Inpatient (IP) Admissions per Patient per Year

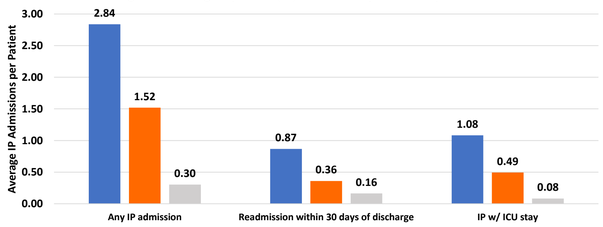


Figure 2. Average IP Length of Stay (LOS) per Patient per Year

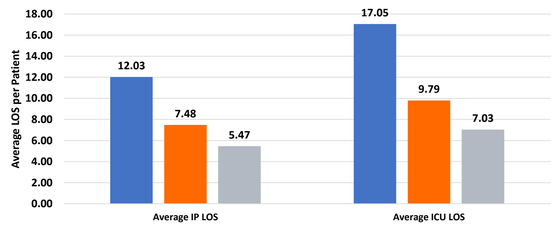
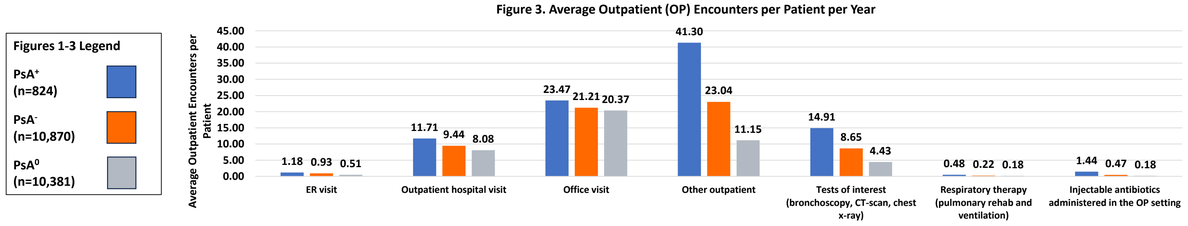


Figure 3. Average Outpatient (OP) Encounters per Patient per Year



RESULTS (Cont.)

- Average IP admissions/patient/year were highest among PsA^+ (2.84) compared to PsA^- (1.52) or PsA^0 (0.30) (**Figure 1**).
- Readmissions within 30 days of discharge were more than twice as likely with PsA^+ (0.87) than either PsA^- (0.36) or PsA^0 (0.16) (**Figure 1**).
- Average IP LOS per patient per year were highest among PsA^+ (12.03) compared to PsA^- (7.48) or PsA^0 (5.47) (**Figure 2**).
- Average intensive care unit (ICU) LOS per patient per year were highest among PsA^+ (17.05) compared to PsA^- (9.79) or PsA^0 (7.03) (**Figure 2**).
- OP encounters were highest among PsA^+ (66.88±41.41) compared with PsA^- (46.08±27.99) or PsA^0 (32.92±20.58).
- Average annual injectable antibiotic treatments in all settings were highest among PsA^+ (1.64) compared with PsA^- (0.50) or PsA^0 (0.18).

CONCLUSIONS

- **NCFB is associated with a large HRU burden in US Medicare patients, particularly among those with *PsA* and exacerbations.**
- **Findings suggest that when NCFB patients have a *PsA* coinfection and experience an exacerbation, their burden is substantially increased compared to those with NCFB only.**
- **No curative treatments currently exist for NCFB patients with *PsA* and exacerbations.**
- **Additional research is needed to increase awareness of NCFB and the need for consensus treatment guidelines.**

LIMITATIONS

- It is plausible that *PsA* is under-coded in the LDS thereby making some patients in our study grouped with exacerbations and no *PsA* belonging in the *PsA* with exacerbations group.

DISCLOSURES

This study was sponsored by Zambon S.p.A.

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