Costs and Length of Stay in Hospitalized Patients with Idiopathic Pulmonary Fibrosis: Analysis of the National Inpatient Sample

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BACKGROUND

- Idiopathic pulmonary fibrosis (IPF) is a chronic, progressive, interstitial pneumonia of unknown cause and poor prognosis, occurring predominantly in older adults.1
- Overall US prevalence is estimated to be between 13 and 63 per 100,000 persons.2
- IPF patients are often hospitalized for disease progression and respiratory failure and such hospitalizations may be a major driver of healthcare cost.3

OBJECTIVE

- To estimate the economic impact of hospital care in IPF, and to identify factors associated with cost and length of stay (LOS) in a cohort of IPF patients admitted for respiratory illnesses to short-stay hospitals in the US.

METHODS

Design and data sources:
- Cross-sectional retrospective cohort study using the National Inpatient Sample (NIS), the largest publicly available all-payer US inpatient database
  - NIS contains claims data from > 7 million hospital stays/year from a nationally representative sample of acute care hospitals
- Study included all hospitalizations in the NIS from 2009 to 2011 with
  - a claim for IPF (ICD-9-CM code 516.3, 516.31) and
  - a principal diagnosis of respiratory disease (ICD-9-CM 460-519),
- Admissions for lung transplant were excluded.
- Statistical analysis:
  - All variables weighted to represent national estimates.
  - Costs calculated using cost-to-charge ratios and adjusted to 2011 US$.
  - Linear regression to identify factors associated with cost and LOS.
- Domain analysis to account for the use of subpopulations rather than the entire sample.
- Statistical analyses performed using SAS® version 9.4.

RESULTS

- From 2009 to 2011 22,350 patients with IPF were admitted to US hospitals with a principal diagnosis of respiratory disease (ICD-9-CM 460-519).
- Mean (SE) age was 70.0 (0.32), and 50.9% were male.
- 43.1% of all admissions had a principal diagnosis of IPF.
- Common chronic IPF comorbidities that do not lead to hospitalization (e.g. GERD, sleep apnea and obesity) are likely underreported in this database of inpatient services.
- Use of invasive mechanical ventilation had the largest effect on LOS and cost, with an increase of 9.82 days [95% CI 8.42 - 11.23] and $36,911 (32,253 - 41,568) respectively.
- Non-invasive ventilation was associated with an increase of 2.03 days [0.94 - 3.12] in LOS and $5,000 (3,737 - 6,826) in cost.
- Patients transferred to other facilities may have died before discharge from those facilities, or required home health care after discharge.
- These findings highlight the need for further investigation into treatments and care processes that reduce the rate and cost burden of IPF hospitalizations.

LIMITATIONS

- Only costs and morbidity claims data from hospitalization captured which likely underestimates both overall patient cost and comorbidities.
- Patients transferred to other facilities may have died before discharge from those facilities, possibly leading to underreporting of deaths.
- Common chronic IPF comorbidities that do not lead to hospitalization (e.g. GERD, sleep apnea and obesity) are likely underreported in this database of inpatient services.

CONCLUSIONS

- There are about 7,000 respiratory-related IPF admissions every year.
- Hospital charges average more than $55,000 per admission and costs (calculated using cost charge ratios) are more than $16,000, suggesting an overall annual IPF hospitalization cost of more than $110 million per year.
- Although there is some evidence of decrease in LOS over the last several years, means costs are not decreasing.
- The in-hospital death rate was 14%, and an additional 35% of patients were transferred to other facilities or required home health care after discharge.
- These findings highlight the need for further investigation into treatments and care processes that reduce the rate and cost burden of IPF hospitalizations.

REFERENCES


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