Identifying Primary Spontaneous Pneumothorax from administrative databases

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Introduction

• Primary spontaneous pneumothorax (PSP) is common (6-24/100,000)
• Must be distinguished from secondary pneumothorax (SP), which arises from an underlying lung disease (COPD, cystic fibrosis, etc.), trauma, or as a result of a medical procedure
• PSP peaks at 20-30 years; SP peaks past 55 years
• Currently, the International Classification of Diseases (ICD-10-CA) does not identify PSP, making the large-scale study of PSP (i.e. using administrative databases) impossible.

Hypothesis

• Administrative data can be used to identify primary spontaneous pneumothorax
• This can be accomplished using a novel algorithm designed to differentiate PSP from SP

Methods

<table>
<thead>
<tr>
<th>Measure</th>
<th>Total</th>
<th>0 – 39 years</th>
<th>&gt; 40 years</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
<td>94 (88 – 98)</td>
<td>97 (91 – 99)</td>
<td>81 (54 – 96)</td>
<td>0.0376</td>
</tr>
<tr>
<td>Specificity</td>
<td>57 (43 – 69)</td>
<td>48 (26 – 70)</td>
<td>62 (45 – 77)</td>
<td>0.4135</td>
</tr>
<tr>
<td>PPV</td>
<td>77 (68 – 84)</td>
<td>87 (78 – 93)</td>
<td>46 (28 – 66)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>NPV</td>
<td>87 (73 – 96)</td>
<td>83 (52 – 98)</td>
<td>89 (71 – 98)</td>
<td>0.6342</td>
</tr>
</tbody>
</table>

Table 1. Diagnostic performance of the administrative data algorithm for the identification of primary spontaneous pneumothorax cases (estimate and 95% confidence interval)

Discussion

• There is a dearth of population level studies on PSP (specifically), and such studies could define predictors of recurrence and lead to treatment recommendations tailored towards this otherwise healthy population.
• The algorithm presented here represents the first attempt to isolate PSP from the pooled pneumothorax designation in administrative databases.
• With a 97% sensitivity for the target age group, and a PPV of 87%, the algorithm demonstrated its ability to accurately identify PSP from pooled data.
• This makes the algorithm an extremely useful tool for the study of PSP using administrative databases.

Conclusion

The algorithm presented here is a novel, validated tool which can be used to conduct epidemiological studies on primary spontaneous pneumothorax.

1. COPD, thoracic endometriosis, pneumocystis, sarcoidosis, tuberous sclerosis, rheumatoid arthritis, ankylosing spondylitis, scleroderma, Ehlers-Danlos syndrome, Marfan syndrome, Langerhan's syndrome, cystic fibrosis, interstitial lung disease, lung neoplasm
2. Chest trauma, foreign body, status asthmaticus, pneumonia, lung abscess