BACKGROUND

Stevens-Johnson syndrome (SJS) is a rare, potentially life-threatening disease that is characterized by widespread epidermal necrosis 1 with a potential for severe morbidity, or death 2 with an incidence of 1.1 to 7.1 cases per million per year. Though SJS has been linked to viral infections and malignancies, it is predominantly associated with medication.1,3

While administrative claims data are recorded for billing and reimbursement purposes, these data provide a wealth of information for the prevalence, incidence and impact of adverse events. Though these efforts may provide much value, it is imperative to assure claims results are validated.

Validation of specific ICD-9-CM claims codes for adverse events is an important component of methods work related to, and in support of, the FDA's Sentinel Initiative to establish a national electronic system to track the safety of drugs, biologics, medical devices—and ultimately all FDA-regulated products in the post-market setting.

METHODS

This was a retrospective validation study examining the positive predictive value (PPV) of the ICD-9-CM diagnosis code 695.1x for identifying SJS in the HealthCore Integrated Research Database (HIRD®), which represents longitudinal claims data from a large commercially-insured population in the United States. Diagnosis code 695.1x was used for identifying SJS, TEN and EM, until October 2008.

Data were available for 2 health plans from January 1, 2001 through November 30, 2007, and for the remaining 12 plans between January 1, 2004 and November 30, 2007.

To be eligible for the study cohort, patients must have had ≥1 medical claim linked to the first ICD-9-CM code 695.1x between July 1, 2000/2004 and May 31, 2007.

All patients had to satisfy the eligibility criteria, with continuous enrollment for ≥6 months before and after the first identified inpatient or outpatient diagnosis suggestive of possible SJS.

Chart Abstraction and Validation

Contact information of the physician office or hospital/inpatient facility was identified and for the remaining 12 plans between January 1, 2004 and November 30, 2007.

One hundred (100) charts were abstracted from the inpatient setting and 100 from the outpatient setting (with 50 from dermatologists’ offices and 50 from other office settings). Medical record abstraction and review were performed over a 6-month period.

RESULTS

A total of 7,499 potential cases of SJS were identified in the claims data using the ICD-9-CM diagnosis code. The mean age of all patients was 26.6 years (±24.6; median=18.5).

There were 20 cases (out of the 200 total charts obtained) in which adjudication was required.

Five (5) SJS cases were validated with clinical certainty (PPV=2.50%; 95% CI = 0.80–5.70%) in the overall sample.

When evaluating only the first diagnostic field within the inpatient setting (73 cases), claims diagnosis of SJS, the PPV was 4.11% (CI = 0.86%-11.54%, Table 1).

Among the 200 patients, the PPV for those with final decisions of “clinical certainty” or “probable” cases of SJS was 6.00% (CI = 3.14%-10.25%, Table 1).

DISCUSSION

Utilizing large-scale data for medical product safety research and surveillance activity requires understanding coding variability from various sources, particularly when ICD-9-CM coding is historically non-specific to a particular, rare adverse event.

Our retrospective administrative claims-based study in SJS reinforces the need to validate administrative claims codes against medical chart review for accurate identification of rare adverse events or conditions and furthermore, supports previous analysis and assessment of administrative claims-based data applied to SJS.

There are a number of salient factors that present as barriers to accurately identifying the burden of SJS and its outcomes using health insurance/administrative claims data. The classification of severe skin reactions is ambiguous due to similar manifestations and data abstracted by a trained chart abstraction vendor in order to complete the medical record abstraction form.

In the event the physician reviewers were discordant (“1 reviewer rendered a “non-case” decision and the other a “case”), an adjudication panel consisting of the two SJS physician reviewers and a third clinical expert was convened to reevaluate each of the discordant charts. The reviewers came to a mutual case determination about all of the previously discordant charts. The final case status, as determined by initial or adjudicated review, was recorded for the purpose of the calculation of the PPV.

PPVs were calculated as the number of patients identified by the claims coding algorithm and confirmed by the physician reviewers as having had SJS (“true positives”) divided by the total number of patients identified by the claims algorithm (“claims positives”).

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Table 1. PPV for Subsets of the Patient Sample

<table>
<thead>
<tr>
<th>Sample</th>
<th>Total Number</th>
<th>Identified SJS</th>
<th>PPV (Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient setting only (diagnosis field)</td>
<td>100</td>
<td>2</td>
<td>2% (0-7%)</td>
</tr>
<tr>
<td>Inpatient setting (all diagnosis fields)</td>
<td>75</td>
<td>3</td>
<td>4% (1-12%)</td>
</tr>
<tr>
<td>Overall clinical certainty and probable cases of SJS</td>
<td>200</td>
<td>12</td>
<td>6% (3-10%)</td>
</tr>
</tbody>
</table>

REFERENCES


Figure 1.

Identification of first SJS code 695.1x diagnosis codes;

Linking diagnosis codes to contact information of the physician office or hospital/inpatient facility;

Provide completed abstraction forms to physician reviewers;

Hold study meeting to determine criteria for determining SJS and abstain 20 pilot charts;

Abstract remaining 180 charts;

Record individual reviewer’s results;

Adjudicate 20 discordant charts;

Record and analyze adjudicated results;