Validation of an Ovarian Cancer Line of Therapy Algorithm for Real-World Outcomes Research in Insurance Claims

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Background and Objective

- Real-world evidence (RWE) studies in US healthcare insurance claims datasets provide important information on treatment patterns, healthcare resource utilisation, and outcomes.
- Insurance claims contain important administrative data points, but often have limited clinical information.
- New maintenance therapies for ovarian cancer management have added complexity to identifying lines of therapy for RWE studies.
- The primary objective of this study was to validate a new algorithm for determining lines of therapy from claims data using medical records.

Conclusions

- This algorithm demonstrated strong concordance with medical records at identifying lines of therapy in ovarian cancer insurance claims data.
- This algorithm has significant applications for studies about treatment patterns, patient outcomes, and healthcare costs.
- The study also highlights the unique opportunities and strengths of conducting ovarian cancer outcomes research in both insurance claims data and medical records.
- Results can inform the selection of appropriate datasets for individual research questions.

Limitations and Discussion

- This research highlights that complex algorithms, like the one evaluated in this study, can accurately estimate lines of therapy in insurance claims increasing the usefulness for RWE research.
- Claims and charts have unique strengths and weaknesses. Charts identified more clinical events since they include information on events which may not have generated a claim billable to a third party. Claims contained more mortality data since they are linked to the Social Security Administration Death Index.
- As this study included abstraction of charts from only a single oncology provider per patient, some clinical data may have been missing for patients treated by multiple providers.
- Because the study population was selected from among patients with specific commercial or Medicare Advantage insurance, results may not be generalizable to all populations.

Methods

The Optum Research Database (ORD) is a large US database that curates administrative claims from commercial and Medicare Advantage insurance plans.

- The algorithm to determine lines of therapy was created based on timing of events, therapies, and treatment gaps utilizing ORD for advanced ovarian cancer.
- The current study validated the algorithm by selecting patients in the ORD with at least six months of data who started chemotherapy between December 2014 and September 2015 to allow up to 33 months of possible follow-up time.

- Corresponding medical records were abstracted from oncologists.

- We report descriptive statistics, the percentage agreement between medical records and claims data, and Kappa statistics to measure the magnitude of agreement for lines of therapy.

Algorithm Description

- Identify eligible sample in claims: apply study inclusion and exclusion criteria to claims data to identify a study population
- Identify eligible providers: using data available in claims, identify the provider most likely to have submitted oncology-related claims
- Request patient medical records: request and obtain charts for patients identified in step 1
- Match claims and medical record data: compare the line of therapy and patterns between the claims and charts

Results

- A total of 294 patients were included in the analysis with a mean age of 54.8. Most patients (94%) had advanced (stage III/IV) ovarian cancer.
- Overall, the algorithm demonstrated a substantial agreement between claims and medical record data for the total number of lines of treatment and maintenance therapy and there was moderate agreement for neoadjuvant therapy.
- The algorithm performed best at identifying early treatment and maintenance regimens.
- Claims, which are linked to the Social Security Administration Death Index, identified a substantially larger number of deceased patients at the end of follow-up compared to medical records (Figure 6).
- For baseline clinical events, claims identified numerically more patients with events such as blood transfusions whereas medical records identified more instances of clinical events, such as hypertension (Figure 7).

- The primary objective of this study was to validate a new algorithm for identifying lines of therapy in ovarian cancer insurance claims data.

Figure 1: Study Diagram

Figure 2: Patient Attraction

Figure 3: Patient Characteristics

Figure 4: Cancer Stage at Diagnosis

Figure 5: Algorithm Performance at Identifying Line of Therapy

Figure 6: Clinical Events in 3 Months Prior to Index Claims vs. Charts

Figure 7: Mortality Data Claims vs. Charts