A substantial part of real-world evidence data in oncology are generated based on medical record reviews (MRRs). This poster aims (1) to summarize methodology recommendations for oncology studies based on a MRR, (2) to describe the methodological trade-offs, (3) to provide guidance on how MRR studies in oncology should be conducted.

Methods

A review of existing guidelines and methodology publications involving MRRs was conducted. Additionally, our evaluation was also based on a large MRR study in advanced non-squamous lung cancer (LENS study) and a separate validation study. LENS is a retrospective observational longitudinal MRR study that was conducted between October 20, 2013, and April 25, 2014 in four European countries (France, Italy, Spain, Germany). Its main objective was the description of anSCCL treatment patterns.

Patients with an initial diagnosis of advanced/metastatic non-small cell lung cancer (anSCCL, stages IB/II) between 07/2009-08/2011 were included. In order to validate the initial study results, to assess potential study biases as well as to prepare a second stage of the LENS study, the study team conducted a separate LENS validation study in three of the four LENS countries. This validation provided additional information about the suitability of the LENS study design and potential trade-offs and study design decisions required for the design of the extension in the additional European countries.

In the LENS validation study, study sites already having participated in the LENS data collection in Italy, France, and Germany were invited to participate. Both qualitative and quantitative techniques were used. For the qualitative component, study sites were asked about specific of their patient inclusion and data documentation during LENS. In the quantitative component, study sites documented main patient/treatment characteristics of anSCCL patients treated in the study sites from July 1st, 2009 until August 31st, 2011 (two randomly selected anSCCL patients per half-year, yielding 8 patients per study site). To identify potential selection bias in LENS – due to inclusion/exclusion criteria – the only inclusion/exclusion criterion applied for the validation study was a confirmed anSCCL diagnosis.

Results

Learnings from the LENS Study

- Generally, the LENS validation study showed that baseline sociodemographic and clinical characteristics of patients included in the main LENS study were very similar to those of the LENS validation study.
- There were, however, differences in percentage of patients having received mutation testing, and to overall survival of patients (Table 1).
- In the LENS study, a higher percentage of patients who were diagnosed later in the recruitment period led to an over-estimation of both the percentage of patients having received mutation testing and overall survival.
- However, even taking into account these differences in inclusion periods, the percentage of patients having received mutation testing was still substantially higher in the main LENS study compared to the validation cohort (Table 1). This pattern was explained by the study sites in the qualitative validation survey (Figure 1). Study sites confirmed that selection of study patients in the main LENS study led to the exclusion of a substantial number of patients. Main reasons for such exclusion included non-availability of various data.
- For patients receiving a mutation test, complete data were available much more often than in other patients. Overall, the validation study results showed that LENS data need to be interpreted in the context of the specific population.

Learnings from Literature Review

Based on our literature review, we conclude that a MRR study design as well as its implementation and reporting should meet 42 different methodology recommendations. We categorized these 42 recommendations into 11 study design and study results reporting areas (Table 2).

Study Design Decisions

- The LENS study design was well in line with the above shown 42 methodology recommendations. Hence, any bias present in this study is likely to have been the result of other than compliance to these recommendations.
- Based on the experiences gained in the LENS study, we concluded that certain design decisions markedly influenced the characteristics of analyzed patients and thus study results. So, as an example, the LENS exclusion criteria (missing death date, incompleteness of treatment data) led to exclusion of patients.
- These decisions can be generalized to study design decisions that have to be made in every MRR.
- Specifically, five different study design areas requiring decisions on prioritization of whether a high depth in patient-level data or a high breadth in study population is sought (Figure 2). Such decisions may include study design trade-offs.

Conclusions and Recommendations

(1) Based on the conducted literature review, we have identified 42 different methodology recommendations, which were included in a MRR checklist. We recommend that a MRR should follow these rules (Table 2).
(2) In addition, researchers should prospectively design a general study strategy that explicitly includes a decision on whether a high depth in patient-level data or a high breadth in study population is sought. A high depth in data is required to describe patient/disease characteristics which are generally needed if a comparison of results with clinical studies is sought. However, this is associated with a challenging minimum data requirement. This often leads to exclusion of a substantial part of patients from the study. In contrast to that, a high breadth in the study population will result in a higher generalizability of study results.
(3) The 11 study design decisions driving a study towards a more “high depth in data” study design or towards a more “high breadth of study population” design have explicitly been included in our checklist.
(4) Our checklist may support study teams in designing future MRR studies. It can also be used to assess the methodological quality of existing studies.

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Keywords

Oncology, Medical chart review, Observational studies, Retrospective studies, Real-world evidence studies

References
