First insights from the German Health Data Lab: Real-world epidemiology and outcomes of transthyretin amyloid cardiomyopathy (ATTR-CM) in Germany

EPH189

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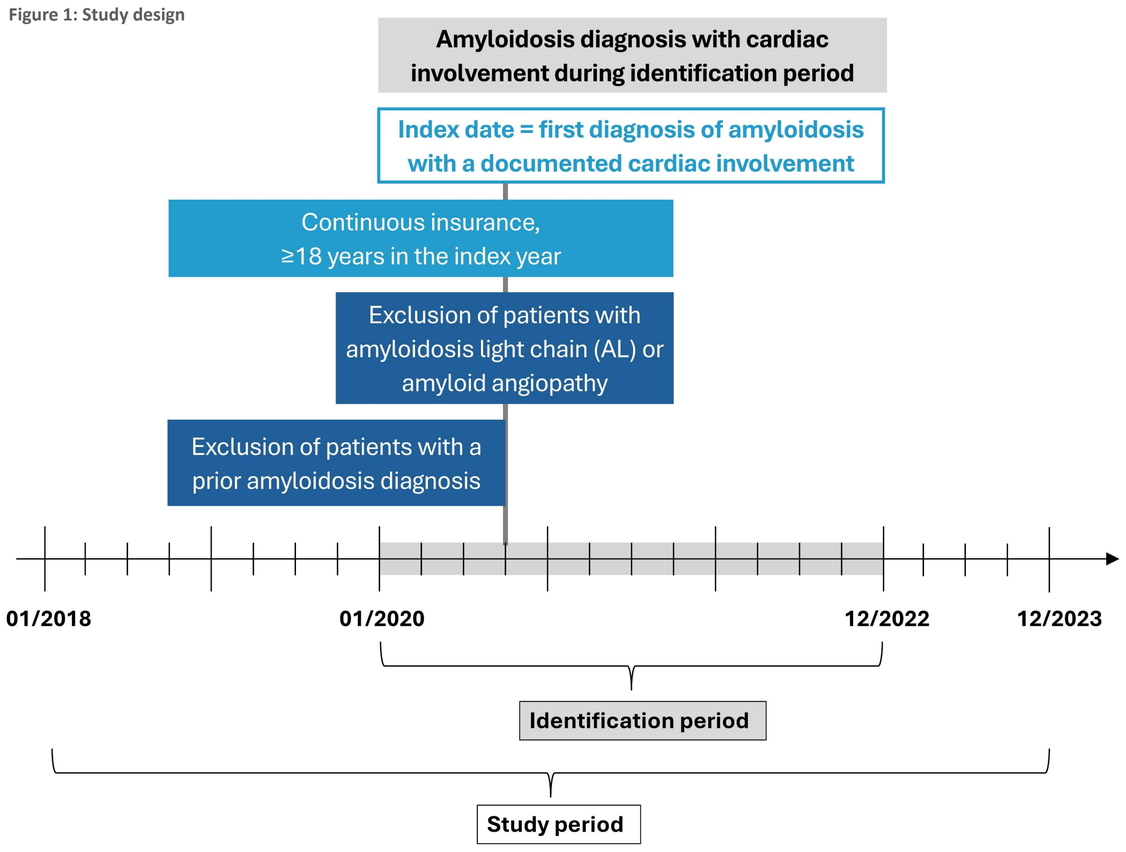
Background

- Transthyretin amyloid cardiomyopathy (ATTR-CM) is a rare, life-threatening disease in which misfolded transthyretin protein accumulates in the myocardium causing progressive cardiomyopathy.
- Advances in imaging modalities and availability of disease-modifying therapies have facilitated earlier diagnosis and improved survival among patients with ATTR-CM.
- **This study aims to describe incidence, characteristics and health outcomes of patients with ATTR-CM in Germany, using data from the newly established "Forschungsdatenzentrum Gesundheit" (Health Data Lab, HDL) covering all individuals with statutory health insurance (SHI) in Germany (ca. 73 million people).**

Methods

- **A feasibility analysis using the WIG2 benchmark database (ca. 3 million SHI-insured individuals) was conducted:**
  - To test the selection algorithm for the study population and to assess whether the outcomes of interest are suitable and can be operationalized in claims data.
  - To understand the impact of missing hospital outpatient diagnoses (HOD) data in the HDL, as HOD are not available in the HDL, but the in the WIG2 database.
- **Analysis design:**
  - The study period covered the years 2018 to 2023 and was conducted in adults with incident ATTR-CM between 2020 and 2022 (identification period).
  - To assess the impact of missing HOD information, two cohorts were generated from the same source population: a cohort identified using HOD information and a cohort identified without HOD information. Number of patients, age, index date, and comorbidity profile were compared between cohorts.
  - As there is no specific ICD-10 code for ATTR-CM, we adapted previously developed claims-based algorithms requiring a diagnosis of amyloidosis and evidence of cardiac involvement in temporal association with the amyloidosis diagnosis to identify the study population, while excluding other types of amyloidosis [1-5] (**Figure 1**).

Figure 1: Study design



Results

- The WIG2 benchmark database identified 291 incident ATTR-CM patients. Extrapolated to the population covered by statutory health insurance through HDL, this would correspond to approximately 6,300 patients.
- The lack of HOD data resulted in a loss of 11% incident ATTR-CM patients (**Figure 2**).
- There was an overlap of 248 patients between the two cohorts (with/without HOD). Of these, 62 patients (25%) had a different index date depending on whether they were identified with or without HOD. The absence of HOD resulted in an average delay of roughly one quarter in the index date.
- Patients identified only through HOD were younger (78 vs. 80 years).
- Prevalence of baseline comorbidities was lower, if HOD information was not included (**Figure 3A**). The proportion of misclassified individuals ranged from 2% (5 of 291) for myocardial infarction and stroke to 9% (25 of 291) for coronary heart disease and 13% (39 of 291) for hypertension.
- The HOD data showed a higher proportion of patients in NYHA classes 1 and 2 and a lower proportion of patients in classes 3 and 4 (**Figure 3B**).

Conclusion

- The HDL provides a unique opportunity to study ATTR-CM at national level by covering the entire German SHI population. However, the current absence of HOD data may lead to incomplete patient identification, differences in patient characterization, and changes in index date assignment.
- Not taking HOD into account may result in an underestimation of ATTR-CM incidence rates and comorbidity prevalence, and in an overestimation of the proportion of patients in higher NYHA classes.
- Conducting and validating the study concept in a benchmark/sample database prior to implementation in the HDL was extremely valuable. It helped validate the patient identification algorithm and identify potential challenges early in the process.
- A learning was the importance of allowing sufficient time for study implementation and result generation within the HDL. Based on our experience, future projects may benefit from planning a timeline of around one year.

Figure 2: Patient selection based on the WIG2 database

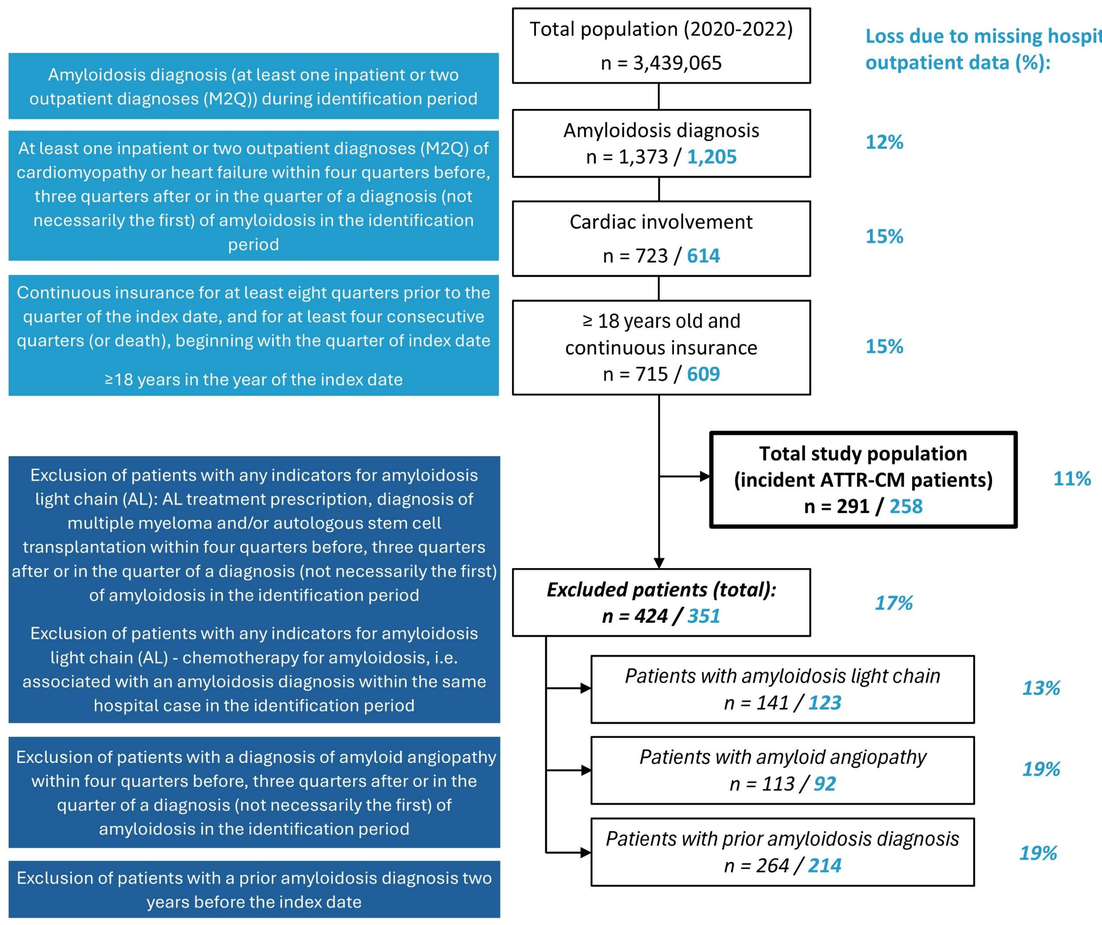
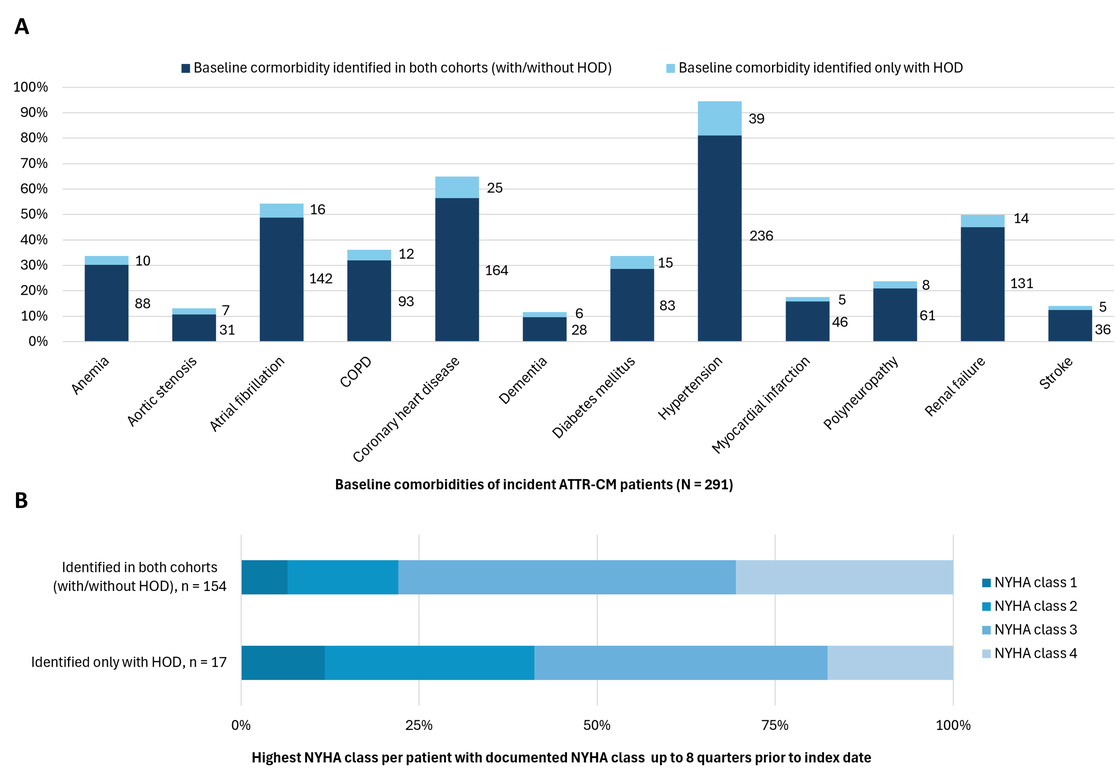


Figure 3: Impact of missing hospital outpatient diagnoses (HOD) data on baseline comorbidities (A) and NYHA class (B) in the incident ATTR-CM cohort based on the WIG2 database. Numbers next to the bars refer to absolute numbers of individuals with the comorbidity.



References

[1] Ney S et al. Clin Res Cardiol 2023; 112:401–8
[2] Damy T et al. Orphanet J Rare Dis 2023; 18:345
[3] Lauppe R et al. ESC Heart Fail 2022; 9:2528–37
[4] Lauppe RE et al. Open Heart 2021; 8(2)
[5] Tsang C et al. BMJ Open 2023; 13:e070028

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