Incidence and prevalence of cardiomyopathies in Poland and outcomes for patients in the years 2016–2020

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INTRODUCTION

Regardless of the increasing number of novel screening and diagnostic methods, the diagnostic process in cardiomyopathies (CMs) remains poor [1, 2]. This results in differences between theoretical and real-life data on CM incidence and prevalence [3]. Despite the discrepancies, the data indicate an increasing importance of CMs in the incidence and prevalence of illnesses and deaths [4]. Based on current estimations of hypertrophic CM (HCM) prevalence of 1:200 [1], HCM may affect 180 000 patients in Poland. We are aware of differences between the numbers of estimated and diagnosed patients in our country; however, the scale of the problem has not been evaluated yet. In this article, we aimed to investigate the registered annual incidence and prevalence CM rates, as well as outcomes for patients with a clinical diagnosis of CMs in Poland in the period 2016–2020.

METHODS

This population-based cross-sectional study was conducted using the Polish National Health Fund (NFZ, *Narodowy Fundusz Zdrowia*) database. The database was queried using International Classification of Diseases and Related Health Problems, 10th Revision (ICD10) codes I42, I42.0, I42.1, I42.2, I42.3, I42.4, I42.5, I42.6, I42.7, I42.8 or I42.9 [5] to identify CM patients from January 1, 2016 to December 31, 2020. The analysis was performed separately in the whole CM population and in specific CM types defined as dilated CM (DCM) — I42.0, HCM — I42.1 or I42.2, and others (remaining codes). The above-mentioned ICD-10 codes were derived from patient hospitalization records at any time during the course of the disease. Exclusion criteria involved ICD codes consistent with ischemic heart disease: I24, I25, I21, I20. The analysis comprised information on the initial diagnosis of CM with a potential transfer to another department or hospital, other hospital admissions, and data from outpatient visits.

Statistical analysis

The registered incidence was defined as the number of new patients per year who, for the first time, appeared in the NFZ database with the applicable ICD-10 codes. The registered prevalence was defined as a number of patients, who appeared at least once in the NFZ database with the mentioned earlier ICD codes and who were alive by December 31 of the index year. The number of deaths was estimated based on data from 2016–2020 obtained from the public healthcare system and the Ministry of Digitization. Epidemiological indicators for voivodeships were standardized by age, sex, and place of residence for the Polish population, based on the Central Statistical Office data. Statistical significance for the comparison of survival curves for the analyzed variable was verified using the
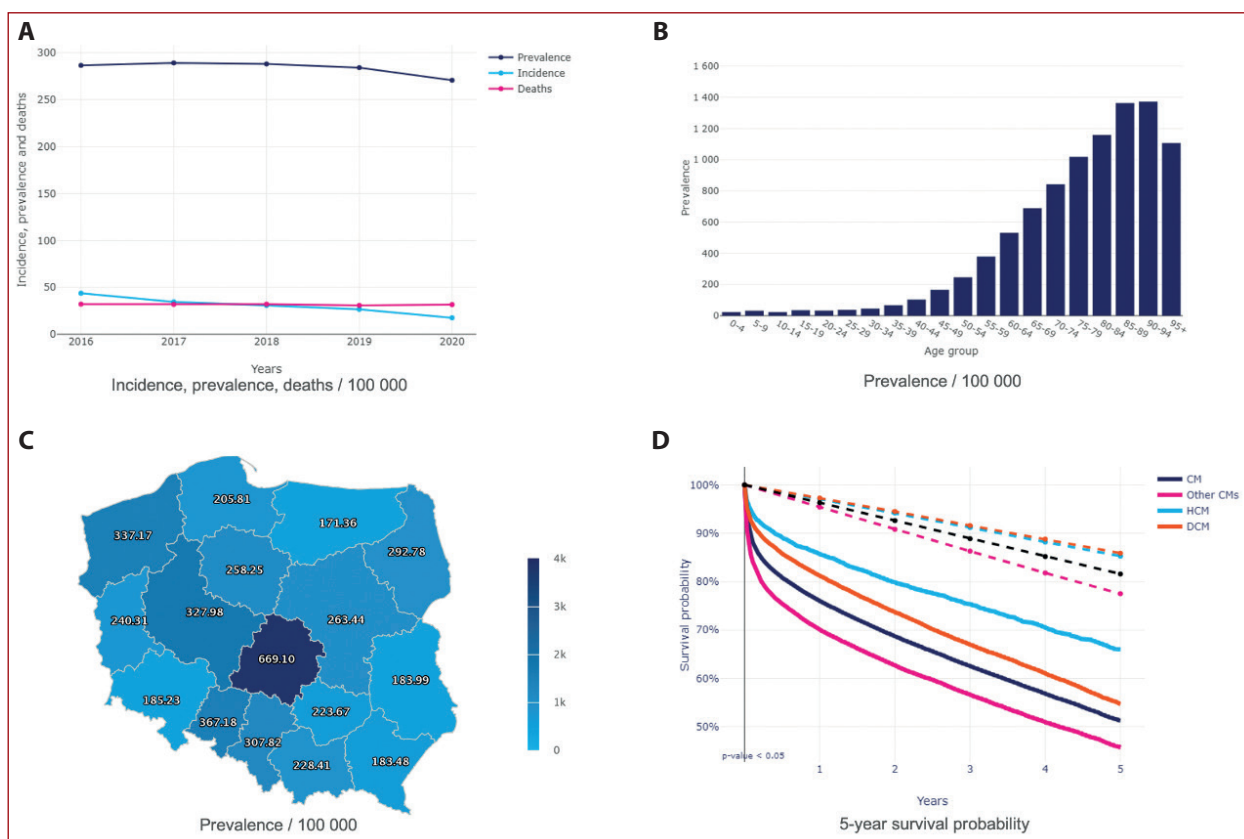
Figure 1. A. Registered annual prevalence, incidence, and number of deaths from cardiomyopathies (CMs) in Poland in the period 2016–2020 — data per 100 000 inhabitants. **B.** Registered prevalence of CMs in Poland in 2019 according to the age — data per 100 000 inhabitants. **C.** Registered prevalence, of CMs in Poland in 2019 according to the voivodeship — data per 100 000 inhabitants. **D.** The 5-year estimated survival rate in the analyzed types of the registered CM population: hypertrophic CM, dilated CM, and others (*P*-value for the difference between estimated survival curves for individual cardiomyopathies; dotted lines: population matched by the age and sex)

Mantel-Haenszel test (log-rank) for the Kaplan–Meier survival estimator.

RESULTS AND DISCUSSION

In 2016, the annual incidence of CM was 16801 (43.72/100000, 0.044%; 64% males [M]), and in 2020 it decreased reaching 6729 (17.59/100 000, 0.018%; M: 67%) CM patients.

The annual prevalence of CM in the period 2016––2020 was between 110146 (285.59/100 000, 0.286%) in 2016 and 103638 (270.84/100 000, 0.271%) in 2020 (Figure 1A).

The following data were registered for CM subtypes:
- DCM — the annual incidence of DCM in 2016: 6307 (16.31/100000, 0.016%; M: 82%); in 2020: 2898 (7.57/100 000, 0.008%; M: 81%); the annual prevalence of DCM in 2016: 46010 (119.71/100 000, 0.119%); in 2020: 43595 (109.05/100 000, 0.109%),
- HCM — the annual incidence of HCM in 2016: 1494 (3.89/100000, 0.004%; M: 55%); in 2020: 782 (2.04/100 000, 0.002%; M: 58%); the annual prevalence of HCM in 2016: 13271 (34.53/100 000, 0.034%); in 2020: 14094 (36.83/100 000, 0.036%).

The total number of annual deaths was comparable between the years (2016 — 12360, 32.16/100 000, 0.032%; 2020 — 12141, 31.73/100 000, 0.032%) — in 2020 the

number of deaths exceeded the annual incidence of CM diagnosis (Figure 1A).

The following data were registered for CM subtypes:
- DCM — annual mortality in 2016: 4770 (12.41/100 000, 0.012%); in 2020: 4948 (12.64/100000, 0.013%);
- HCM — annual mortality in 2016: 824 (2.14/100 000, 0.002%); in 2020: 1000 (2.61/100 000, 0.003%).

The registered annual prevalence of CMs in 2019 according to the age and voivodeships is presented in Figure 1B–C. The 5-year survival rate was significantly lower in the CM population (51%) as compared to the population matched in terms of age and sex (82%). The 5-year survival rate was low and differed between CM subtypes: HCM (66%), DCM (55%), and others (46%; *P* <0.01) (Figure 1D).

The presented study is the first population-based cross-sectional analysis summarizing data on the registered prevalence and incidence of CMs in Poland in the period of 2016–2020. In 2016 the registered annual incidence of CMs was 43.72/100 000, and it decreased in 2020 reaching 17.59/100 000 as a result of the COVID-19 pandemic. The annual prevalence of CMs and the number of annual deaths remained at a constant level over the analyzed period; in 2020 the number of deaths exceeded the annual incidence of CM diagnosis. The analysis of the 5-year survival rate showed significantly reduced life expectancy in the whole

CM population and in the subgroups with DCM and HCM. Indices were comparable to the data from analogous registries from other countries [6–10], yet lower than the standard data on the epidemiology of CMs reported in the literature [1].

In our analysis, the registered prevalence of CMs in 2016 was 285.59/100 000 (0.286%; 1:350). Taking into consideration the number of inhabitants, it corresponds to approximately 120 thousand people who were registered in the NFZ system with the ICD code indicating CM. This value differs from the literature data [1] and confirms that CMs are underdiagnosed in Poland.

Additionally, in 2020, the registered incidence of CMs was 2.5 times lower than in 2016, which resulted from restrictions related to the COVID-19 pandemic.

Notably, 64%–67% of the CM population were men, which is consistent with the results of other published epidemiological data [6, 7]. Current results indicate that the registered incidence and prevalence of DCM was higher than HCM in line with a similar British analysis [6] and data from ESC guidelines (DCM: 0.036%–0.400% vs. HCM 0.2%) [1]. In our analysis, the registered prevalence of DCM and HCM was 0.119% and 0.034%, respectively. Data on the HCM epidemiology in the American population based on the Health Core Integrated Research Database (period: 2013–2019) show that HCM's prevalence was 52/100 000 (0.052%) [9]. According to the British data analyzing the period from 2000 to 2018, the recorded prevalence of HCM in 2018 was 3.5/10000 (0.035%) [6], which is comparable to our findings. Similar data were also published by Korean authors showing an HCM prevalence of 0.016% in 2010 and 0.031% in 2016 [7]. In the German population in 2015, the HCM prevalence was 0.07% with an average age of 63 (SD 17) years and 65% of patients were male [8], which shows a similar demographic profile as in our population. Similar to our finding, the registered prevalence of HCM increased with age [7–9]. Our analysis also demonstrated advanced age at CM diagnosis, local differences in the registered epidemiology, and impaired prognosis for CM patients.

Limitations of our study involve data extraction from a large healthcare provider registry based on ICD-10 codes. The ICD-10 classification does not allow for identification of restrictive and arrhythmogenic right ventricular CM. Some cases of CM may have been coded as heart failure leading to overall CM underreporting. Data from 2020 were included in the analysis, but they should be interpreted with caution due to the COVID-19 pandemic.

Conclusions

The study delivers novel data on the registered annual incidence and prevalence of CMs in Poland as well as outcomes for Polish CM patients. The registered annual incidence and prevalence of CMs, together with their unfavorable clinical outcomes, warrant an urgent need for improvement of CM screening and diagnostic processes in Poland.

Article information

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