Invasive cardiology procedures in the Silesian Voivodeship compared with ESC member countries

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INTRODUCTION

Despite significant improvement in diagnosis and treatment, cardiovascular diseases (CVD) remain the primary cause of death worldwide. Although pharmacological treatment constitutes the primary therapy in the vast majority of CVD, in many cases invasive procedures have been shown to improve outcomes as opposed to optimal medical management [1]. Thus, optimal utilization and access to healthcare resources are essential to provide optimal care for patients with CVD. As the fields of interventional cardiology and electrophysiology have been expanding substantially in recent years, with the introduction of more advanced strategies for the management of structural heart diseases and growing evidence supporting the invasive approach in cardiac arrhythmias, it is important to define their present stage to meet future needs of CVD patients [2–4]. This analysis aims to estimate the number of invasive cardiology procedures performed in the Polish Silesian Voivodeship and to juxtapose them with the European statistics based on the 2021 European Society of Cardiology (ESC) Cardiovascular Statistics report [5].

METHODS

The present analysis was performed with the use of data obtained from the questionnaires provided by the cardiology wards in the Silesian Voivodeship to the regional consultant in cardiology. Completing the questionnaires is obligatory once a year for every department in the Voivodeship. The questionnaires include, *inter alia*, information on the exact numbers of hospital admissions and invasive and non-invasive procedures. This study focused on the years 2019–2021. The numbers of all major interventional procedures, including coronary, valvular, electrophysiological, and electrotherapeutical procedures were obtained and divided by the number of Silesian Voivodeship inhabitants.

In order to characterize the reference for the number of procedures performed in the region, and extrapolate them to the supraregional field, the data from the 2021 ESC Cardiovascular Statistics report were obtained [5]. In the report, the CVD statistics from 57 countries, which are members of the ESC, are presented. The document includes a wide spectrum of data, including the prevalence of risk factors, established CVD diagnoses,

and the number of procedures performed in ESC member countries. The primary source of information regarding the number of procedures and healthcare resources in the report had been a survey of all 57 ESC national cardiac societies.

The numbers of the respective procedures per 1 million inhabitants in the regions have been presented in the bar graphs. The presented data refer to the number of procedures performed in the Silesian Voivodeship and were collated with similar data from Poland, the median number of respective procedures for all ESC member countries, and finally with the country, which reported the highest number of every analyzed procedure. If no data referring to the specific countries were available, the number of procedures performed in the high-income countries, according to the ESC report, has been presented. Approval of the ethics committee and patient informed consent were not required for this study.

RESULTS AND DISCUSSION

The numbers of invasive procedures are summarized in Figure 1. In 2019, the number of diagnostic coronary angiographies and percutaneous coronary interventions (PCI) was higher in the Silesian Voivodeship than the median number of these procedures in Europe, as well as in Poland and the European countries reporting most such procedures.

In 2020 and 2021, there was a decline in the number of coronary angiographies and PCIs although both procedures were performed more frequently than the median Polish and European values for 2019. The diagnostic coronary angiographies per 1 million inhabitants in Europe were most frequently performed in Belgium, while Latvia reported most PCIs.

Regarding pacemakers, implantable cardioverter-defibrillator (ICD), and cardiac resynchronization therapy (CRT) device implantations, in 2019, their average number performed per 1 million inhabitants was higher in the Silesian Voivodeship than in the Polish and European statistics. In 2020 and 2021 there was a decline in the number of device implantations; nonetheless, they were performed more frequently than in 2019 in Poland and ESC countries but less frequently than in the countries reporting most of those procedures. Lithuania was the country that reported most pacemaker implantations, while most ICD and CRT implantations in Europe were performed in Germany.

As far as the catheter ablations are concerned, there was a subtle reduction in their relative number between 2019 and 2020, and notable growth in 2021 in the Silesian Voivodeship. Nonetheless, the number of ablations in comparison with Germany, which is the European leader with regard to ablation numbers, was still more than 30% lower per 1 million inhabitants.

The number of structural interventions in the region was substantially growing between 2019 and 2021, as there were 42.0% more transcatheter aortic valve implantation (TAVI) and 58.0% more percutaneous mitral valve implantations in 2021. However, one has to take into consideration the relatively low baseline number of valvular procedures in 2019, compared with Europe and especially with the high-income ESC countries.

The presented findings demonstrate that patients from the Polish Silesian Voivodeship have satisfactory access to the most of invasive cardiology procedures because, in most of analyzed categories, the number of such procedures performed annually per 1 million inhabitants was higher than the overall result for Poland and Europe. Due to COVID-19, almost all non-COVID-related medical admissions had to be reduced to provide care for patients infected with SARS-CoV-2 and reduce the potential viral spread. Thus, in either 2020 or 2021, elective procedures in particular were often postponed or canceled due to surges in the number of COVID-19 patients [6, 7]. Moreover, the burden of CVD treatment was often spread between academic and non-academic facilities, which were often interchangeably transformed into COVID-19-dedicated facilities. The detailed presentation of available invasive procedures performed in the analyzed years in academic and non-academic departments is presented in Supplementary material, *Figure S1*, where an increase in the number of catheter ablations performed in non-academic centers in 2021 is clearly visible.

It is noteworthy that the number of coronary angiographies and PCIs in 2019 in the Silesian Voivodeship was higher than in the countries reporting most of such procedures in Europe. The decline in their number in 2020 and 2021 reflected the necessity to transform some of the cardiology units into facilities dedicated to COVID-19 patients, as well as the growing willingness of physicians to optimize pharmacotherapy, instead of an intervention, on account of the ISCHEMIA trial [8].

Despite COVID-19, there was a major 56.4% increase in the number of catheter ablations performed in 2021 in the region, in comparison with 2019. This trend might be explained by the increasing evidence that the early rhythm control strategy results in better clinical outcomes and a lower risk of recurrence of atrial fibrillation than in the case of medical therapy [4]. This hypothesis is supported by an 89.8% growth in the number of AF ablations in 2021, which was a major catalyst for the growth in the overall number of ablations when compared with 2019.

Nonetheless, when comparing the numbers of ablations performed in the Silesian Voivodeship and Germany, one sees that there is still need for wider adoption of ablations into daily practice. Similarly, the numbers of percutaneous valvular interventions demonstrate an unmet need for TAVI and mitral valve implantations in the region although one has to take into consideration that in recent years, the reimbursement policy for percutaneous valvular interventions in Poland contributed significantly to lowering the availability of these procedures.

The present analysis should be considered in light of a few notable limitations. First, the data from the 2020 ESC

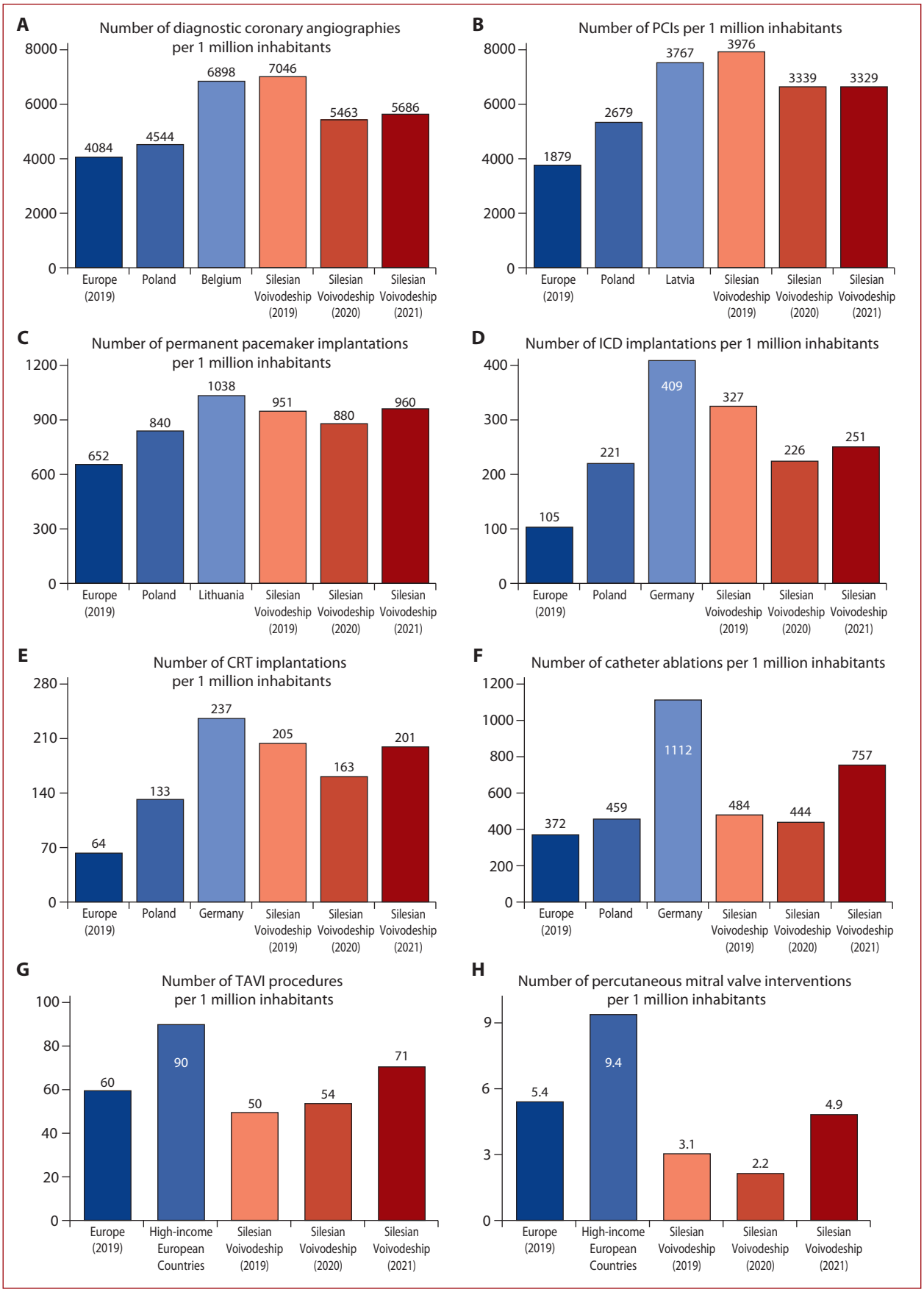

Figure 1. The numbers of interventional procedures in the Silesian Voivodeship, compared with the median for European Society of Cardiology (ESC) member countries, Poland, and the country which reported the highest relative number of each of the analyzed procedures
Footnote: The statistics for Europe describe the median year of data reported for the ESC survey

Abbreviations: CRT, cardiac resynchronization therapy; , ICD, implantable cardioverter-defibrillator; PCI, percutaneous coronary intervention; TAVI, transcatheter aortic valve implantation

survey, which were the source of the comparative analysis presented in this article, were not obtained from all ESC member countries, with an approximately 70% response rate among the member countries. Second, the reported European data came from the median year of 2019; however, in the case of some procedures, the span of the reported years was from 2015 to 2019.

Supplementary material

Supplementary material is available at https://journals.viamedica.pl/kardiologia_polska

Article information

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