"Under the microscope": Infective endocarditis in Poland — mind the gap

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Infective endocarditis (IE) remains a significant public health challenge with an estimated incidence of 14 cases per 100 000 of the population each year [1]. In developed countries, the epidemiology of IE has changed significantly. This is in part owing to an increasing use of intra-cardiac electronic devices (ICEDs) and intravenous drugs along with improving life expectancy [2, 3]. *Staphylococcus aureus* is now the most common cause of IE (~25%–30%) followed by viridans group *streptococci* (~20%) and *enterococci* (~10%) [4]. Despite increasing awareness of IE and access to advanced imaging modalities, mortality remains high at 30% at 30 days [5, 6].

In this issue of the *Polish Heart Journal*, Orzech et al. [7] compared data from 880 patients with IE recruited from 134 Polish hospitals between August 2022 and August 2023 (POL-ENDO registry), with 3116 patients from 156 hospitals in the European Endocarditis registry (EURO-ENDO) [8]. Several important findings emerged from this study. First, the authors observed that Polish IE patients were older, more comorbid and had an increased rate of intra-cardiac devices *in situ*. Second, native valve IE (NVIE) was more common (82.3% vs. 56.6%), and prosthetic valve IE (PVIE) was less common (20.3% vs. 30.1%). Third, there was a greater reliance on ultrasonography to identify IE and its local complications in Poland, with less use of alternative imaging modalities. Finally, recurrent IE was twice as common, heart failure was more common, in-patient surgery was less common (36.9% vs. 51.2%) and in-patient mortality was higher (21.0% vs. 17.0%) in Polish patients when compared to the EURO-ENDO registry data.

The authors should be congratulated for their efforts to understand the landscape of IE demographics and treatment outcomes in Poland when compared to other available cohorts of data. Notwithstanding some limitations, which the authors acknowledge, there are some notable absences that exist within the data presented that may shed some light on the differences observed.

In the management of patients with native heart valve disease, there is now an established role for specialist heart valve clinics to provide surveillance and lifelong care of these patients. One of the functions of these clinics is to provide lifestyle advice and guidance on the prevention of endocarditis [9]. This includes various red flag signs for patients to be aware of and the need for regular annual dental checks and visits to dental hygienists. As the role of specialist heart valve clinics has reached eminence in international guidelines for the treatment and management of heart valve disease, it is unknown whether patients who ultimately presented with NVIE in the POL-ENDO registry were already under the care of a specialist heart valve clinic prior to the index IE event. Given that 880 patients from 156 hospitals were reported in the registry (average of 6 cases per site) there is also likely to have been significant heterogeneity in native valve disease care and IE prevention counseling prior to the IE episode. Furthermore, the current article [7] does not explore the potential reasons for the higher rates of recurrent IE. Were patients seen

in a specialized heart valve clinic at 1 month, 3 months, 6 months and 1 year for post-endocarditis surveillance and advice regarding the use of prophylactic antibiotics for subsequent significant dental procedures?

It is altogether not surprising that transthoracic and transesophageal echocardiography were the principal imaging modalities used to detect endocardial involvement in in the POL-ENDO patients. Echocardiography along with microbiological and clinical examination remain the cornerstone of establishing a diagnosis of endocarditis [10–12]. Nevertheless, the rates of additional imaging use were less than in the EURO-ENDO registry [8] and the proportion of "possible IE" was high at almost 40%. With the current 2023 ESC Guidelines reinforcing the value of advanced imaging (computed tomography [CT] and ^{18}F-fluorodeoxyglucose positron emission tomography [^{18}F-FDG-PET] — class 1B) [9] it is likely that quicker and firmer diagnoses of IE would have been reached for a proportion of patients had this been accessible. Although access to ^{18}F-FDG-PET CT remains challenging even in specialist centres, the early use of CT/magnetic resonance imaging for NVIE to evaluate for paravalvular complications, septic emboli, brain, and spinal involvement would perceivably have resulted in less uncertainty as to a diagnosis of IE [13, 14]. This in turn would have ostensibly facilitated earlier access to multidisciplinary team care, a reduction in complication rates, clearer guideline-based indication for surgery, earlier cardiac surgery, and a reduced mortality. As the authors highlight, the low rates of reported cardio-embolism (5.5%) were likely due to a failure to systematically detect sub-clinical events which may have been averted with a more systematic and liberal use of advanced imaging [9].

A worthwhile addition to the current work would be more crystalline data on the structure of IE care in Poland. It remains uncertain how and if this has been standardized, and whether the model of care used has an impact on the clinical outcomes. For example, it is recommended that IE care should be coordinated within regions by a dedicated team based in a specialized center [9]. This "Infective Endocarditis" team should include infectious disease specialists, cardiologists with a special interest in heart valve disease/cardiac imaging, cardiac surgeons, and cardiac device specialists. There should be ready access to advanced imaging with cardiac CT, magnetic resonance imaging, ^{18}F-FDG-PET and access to specialized spine and neurosurgical teams to manage relevant complications [9]. Although uncomplicated IE can often be managed locally, one would still advocate a discussion of all cases on a weekly basis with the specialist team to ensure appropriate antimicrobial therapy, its duration and the optimal timing of cardiac surgery if indicated. The current manuscript provides little insight into how suspected or confirmed cases of IE are integrated into specialized regional centers. For example, were all cases of complicated IE with *Staphylococcus aureus*, CIEDs, congenital heart disease, severe valve incompetence, structural destruction (abscess, perforation, or fistula formation), heart failure, culture-negative endocarditis, and patients with embolic and neurologic complications transferred to a specialized endocarditis center? If so, over what time period? In the absence of these data, it remains uncertain whether the care delivery model could be enhanced to improve clinical outcomes. Easier access to advanced imaging and more regular discussion by the specialist team would otherwise be expected to enable a quicker confirmation of "definite endocarditis", earlier guideline-indicated surgical intervention, and an anticipated reduction in mortality of approximately 50% [15].

In conclusion, Orzech et al. [7] demonstrate the demographic makeup of patients who acquire IE in Poland compared to the rest of Europe. They also provide an invaluable snapshot of the management and differential clinical outcomes of these patients. These data are a timely reminder to "mind the gap". There is an emerging importance of a wholistic approach to IE management. This ranges from patient education and preventive strategies in high-risk patients, to improved access to imaging and structures of regional and national care involving specialist endocarditis team.

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