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Vlatka Reskovic Luksic, Jadranka Separovic Hanzevacki, Mai-Linh Nguyen Trung, Hélène Petitjean & Patrizio Lancellotti

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LETTER TO THE EDITOR

The burden and challenges of managing aortic stenosis

Over 10 million Europeans live with Valvular Heart Diseases (VHDs), which remain challenging in terms of diagnosis and management [1]. VHDs still represent a leading cause of cardiovascular morbidity and mortality, as well as a health care problem concerning loss of physical ability and worsening of quality of life [2]. Epidemiological data underestimate the true burden of VHD [3], while they are hard to collect due to lack of data from routine examinations, not coding mild VHD, and relatively sparsely available imaging techniques in some countries. Incredible advances in the evaluation and management of VHD have occurred in the past decade, even though prevention is difficult to achieve. Also, VHDs are not well-understood or well-known by the public, general practitioners, or even general specialists [4]. As an example, although systematic auscultation is probably the best way to screen for VHD, it is performed by only 54% of general practitioners in patients with asymptomatic VHD [5]. The decline in the utilisation and training of cardiac auscultation is an unfortunate but hopefully not irreversible trend. It is thus extremely important and useful for the medical community to have high-quality and well-disseminated educational materials, including guidelines, recommendations, and cases gallery [6–11].

Our role as clinicians and scientists is to gradually provide a comprehensive educational program that will serve to bridge the gap between theoretical knowledge and clinical practice. The need for timely diagnosis, earlier identification of high-risk patients, incorporating all imaging modalities and heart teams in the process of clinical thinking, as well as the need for further evidence on time and type of intervention has been a recurrent theme over the past years. Evolving surgical and percutaneous techniques are the promising future in this field [12, 13].

Rheumatic VHD remains by far the most common cause of primary VHD in low-income populations, still not showing a trend of reduction [3]. Degenerative aortic valve (AV) disease showed a sevenfold incidence increase during the last 30 years, with especially significant increase with age (>1000 per 100,000 beyond the age of 75 years) [3]. This increased incidence is related to an increase in atherosclerotic risk factors, ageing population, but also to advances in diagnosing aortic stenosis (AS) (rising awareness and improvement of diagnostic methods) [14–17]. The incidence of AS is higher in developed countries, but in low-income countries (even though the proportion of patients with AS is lower) the absolute numbers are high. The development and advances in surgical and percutaneous treatment options during the past 20 years made a big improvement in treating severe symptomatic disease [6]. However, efforts should be made to understand the course and consequences of not-so-advanced disease, to prevent irreversible remodelling and loss of function of the left ventricle, leading to heart failure [18].

Following the improvements of treatment options and changes in global epidemiology of VHD (ageing populations) is crucial to plan a good health policy, advance clinical approaches, and update guidelines on time [19]. Both the American and European guidelines on the management of VHD are generally concordant and have recently been updated. However, there are some differences concerning indications for surgery, timing and type of intervention and levels of evidence [6]. Disease staging and phenotyping are important for individualised approach. Addressing the challenges in the assessment of VHD with tips, tricks, and critical review of all the methods used for assessing VHD severity, with a vivid discussion is, thus, key [20].

There are still many issues in grading AS. Low-gradient AS with severely reduced aortic valve area (found in 1/3 of the patients with AS) represents a challenging clinical situation [21]. There are many possible sources of error (in the measurement LVOT diameter, obtaining good view and echo alignment for the measurement of peak jet velocity, other concomitant valve diseases such as aortic, mitral or tricuspid regurgitation, atrial fibrillation, and amyloidosis), requiring comprehensive echocardiography study to avoid them [6, 17, 22]. Additional tests such as dobutamine stress echocardiography (DSE), projected aortic valve area calculations, and computed tomography (CT) aortic valve calcium scoring should be used to further determine the severity of AS [3, 23]. The limitations of these methods should be understood, such as underestimation of AS severity by using the CT calcium scoring in patients with specific pathophysiological and pathomorphological changes due to amyloidosis or bicuspid aortic valve [24].

Recent data indicate that patients with moderate AS are symptomatic in 45% of the cases, and prognosis is poor [25]. The burning question is whether to intervene earlier in the group of patients with moderate aortic stenosis and adjutant myocardial disease. One of the ways to recognise high-risk moderate AS with comorbidities is the classification of flow patterns (low gradient moderate AS < 20 mmHg) [26]. Patients with paradoxical

or classical low-flow, low-gradient moderate AS had worse survival outcomes compared with those with normal-flow, low-gradient moderate AS, probably due to left ventricular systolic and/or diastolic dysfunction [26]. The usefulness of the prompt intervention in this group of patients is presently being tested in ongoing trials (PROGRESS, EXPAND, TAVR UNLOAD) [25, 27]. Currently, after discordant moderate AS measurements, use of DSE or CT is suggested to confirm the diagnosis [17, 24]. Afterwards, surgery is indicated if there is other indication for surgery (such as revascularization) and for now, if the patient is symptomatic, it is important to recognise LV dysfunction and treat comorbidities [27].

Burning questions and innovations in transcatheter aortic valve implantation (TAVI) concerning lifetime management, hemodynamics, and durability, as well as some technical perspectives on alternative interventional routes and commissural alignment are sources of huge discussions [28–41]. A recently performed meta-analysis by Wang et al. comparing balloon-expandable (BE) SAPIEN 3 valve and Ultra self-expanding valves (SEV) with EVOLUT R/Pro SEV, showed that at 30 days and 1 year, there were comparable outcome on mortality and stroke rate between the two valve types [42]. SEV was associated with better hemodynamic outcomes, but higher incidence of PVL and risk of permanent pacemaker implantation (PPI). Introductions of the new generation of SE valves as EVOLUT Pro + and EVOLUT FX, and the application of the Cusp Overlap Technic (COT) showed the improved outcome in the PPI rates [43]. The collected real-world evidence for the different international registries confirmed these results, showing the PPI rates with EVOLUT platform between 5% and 12% [42, 44]. Since 2021, the ESC/EACTS guidelines for the management of valvular heart disease have recommended that TAVI should be offered to patients $\geq$75 years with a suitable transfemoral approach, or to those at high surgical risk (HR) (STS-PROM/EuroSCORE II >8%) or unsuitable for surgery [6]. However, uptake of these guidelines and TAVI implantation rates vary substantially between European countries, even though TAVI is cost-effective [45, 46].

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Vlatka Reskovic Luksic and Jadranka Separovic Hanzevacki
Department of Cardiovascular Diseases, University of Zagreb School of Medicine and University Hospital Centre Zagreb, Zagreb, Croatia
vlatka.reskovic@gmail.com

Mai-Linh Nguyen Trung, Hélène Petitjean, and Patrizio Lancellotti
Department of Cardiology, CHU Sart Tilman, University of Liège Hospital, GIGA Cardiovascular Sciences, Liège, Belgium

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