Mortality risk assessment in dilated cardiomyopathy: the Krakow DCM Risk Score

To the editor We read with great interest the recent paper by Kucharz and Kułakowski[1] published in the November 2020 issue of Kardiologia Polska (*Kardiol Pol, Polish Heart Journal*), in which the authors raised the important issue of arrhythmic events (AEs) occurrence and implantable cardioverter-defibrillator (ICD) interventions in patients with heart failure (HF). The finding regarding the predictive role of fragmented QRS (fQRS) in AE gives rise to a much-needed discussion on the novel management of ICD implantation. Given the lack of any clear benefits stemming from ICD implantation in unselected patients with dilated cardiomyopathy (DCM), as shown in the previous studies, and the significant association between appropriate ICD interventions and ischemic etiology of HF reported by Winkler et al[2], we would like to give some consideration to the significant predictors of AE in DCM, especially due to the fact that in the analysis presented by Kucharz and Kułakowski,[1] DCM patients constituted a quarter of the study population.

Notably, none of the HF guidelines differentiate the management strategies based on etiology, whereas a growing body of evidence suggests potentially different levels of risk for AE and nonhomogenous benefits arising from prophylactic ICD implantations in HF. These observations are particularly relevant in the context of the novel therapy with angiotensin receptor neprilysin inhibitors, which reduces the risk for AE.[3] Therefore, novel predictors of AE and appropriate ICD shocks are eagerly awaited and much sought-after in HF and DCM. Bearing in mind the recent important discovery of Kucharz and Kułakowski regarding the predictive role of fQRS in determination of AE risk in the general HF cohort, we are wondering whether there is any relationship between fQRS and HF etiology (ie, ischemic vs nonischemic HF).

As is well-known, nearly 1 in 5 patients with HF and reduced ejection fraction has DCM. What makes DCM patients different from other HF patients is their younger age, smaller number of comorbidities, and a different clinical course of the disease, including a higher likelihood of beneficial left ventricular reverse remodeling. Precise evaluation of risks in DCM patients is of utmost importance, so that appropriate life counselling can be provided (eg, family planning, career guidance), treatment can be guided reliably (eg, step-up or step-down; ICD recommendations, appropriate timing of heart transplantation) and the clinical course of the disease can be predicted. In the upcoming era of tailored medicine, the evaluation of disease-inherent risks is not merely an academic issue but the cornerstone of individualized management. Hence, modern cardiology is at the forefront of scale-dedicated research, and there are now many validated and newly-published scales, including a score evaluatingthromboembolic risk in AF.[4]

Although the number of HF scales is considerable, they are all based on general HF cohorts, consisting mostly of patients with ischemic HF. Consequently, their application in DCM is somewhat questionable. Surprisingly, there is still no scale applicable specifically to DCM. Therefore, to respond to this yet unmet clinical need, we developed a scale based on a fairly large DCM population. Briefly, we analyzed the records of 406 DCM patients during 48.2 months of follow-up.[5] Initially, we examined 8 most popular HF prognostic scales in DCM and found that all of them overestimated the true mortality risks. Next, we built a unique linear model based on 21 parameters, including clinical, electrocardiographic, echocardiographic, and laboratory parameters, as well as the applied treatment. This newly-developed Krakow DCM Risk Score (Krakow-DCM) provided the best accuracy and discriminative power in comparison with all other HF models. Although the number of required parameters is relatively large, all of them are readily available in DCM patients. Furthermore, the Krakow-DCM model supplies the

linear probability of death and allows the calculation of individual mortality risk in 1 to 5 years.

We strongly believe that application of the Krakow-DCM model in daily management of DCM patients may significantly help to redefine the risks and guide the clinical management, for example, by enabling a more accurate referral for ICD therapy. It is quite possible that validation of the fQRS as a predictive factor and its incorporation (if proven to be of value) into the Krakow-DCM model may further bolster the predictive power of this risk score.

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Authors' reply We would like to thank Dziewięcka and Rubiś for their interest in our research. We previously showed that fragmented QRS (fQRS) was a frequent finding in patients with implantable cardioverter-defibrillators (ICDs).[1] It was more common in those with ischemic cardiomyopathy than with dilated cardiomyopathy (DCM), more advanced heart failure and coronary artery disease, higher number of comorbidities, and altered ECG repolarization. It was also present more often in a subgroup with ICD implanted for secondary than for primary prevention.

In the present study, we showed that fQRS in inferior ECG leads was a risk factor for appropriate ICD shocks in the whole ICD population. Unfortunately, a separate subgroup analysis of DCM patients was not possible due to the limited number of patients with both DCM and fQRS. However, Sha et al[2] found that fQRS in patients with idiopathic DCM was a predictor of higher total mortality and higher incidence of arrhythmic events. Moreover, based on the fact that the presence of fQRS is associated with myocardial scar regardless of its etiology,[3] it seems reasonable to expect that this parameter could be linked with adverse cardiac events. Given a relatively low number of arrhythmic events in the general population of DCM patients with ICD, risk stratification in this group remains a challenge. The fQRS appears to be a promising predictive parameter; however, further research in this area is required.

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