Cardiac magnetic resonance imaging as screening for cardiac sarcoidosis or not?

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In the last 2 decades, the wide use of cardiac magnetic resonance imaging (CMR) has revolutionized the diagnostic approach to patients with suspected cardiac sarcoidosis (CS). Several case series have shown that CMR alone was superior to the former (2007) Japanese Ministry of Health and Welfare (JMHW) guidelines on detecting myocardial involvement in patients with systemic sarcoidosis [1–8]. Furthermore, the identification of late gadolinium enhancement (LGE) on CMR; a marker for myocardial damage associated with cardiac sarcoidosis, was strongly associated with major adverse outcomes during follow-up [1–5]. As a result, CMR was considered a major diagnostic criterion in the Heart Rhythm Society expert consensus statement for diagnosis of CS in 2014 [9]. In that document, LGE on CMR in a pattern compatible with CS in patients with extra-cardiac sarcoidosis was consistent with at least probable cardiac involvement, when other causes were reasonably excluded. This was also acknowledged in the revised JMHW guidelines for diagnosis of CS [10].

While the role of CMR as a diagnostic tool has been widely accepted as the gold standard, its role as a screening tool in the general sarcoidosis population remains controversial. In the latest American Thoracic Society clinical practice guidelines in sarcoidosis, CMR was not recommended as part of the screening strategy [11]. Baseline evaluation of the general sarcoidosis population with cardiac symptoms and a 12-lead electrocardiogram (ECG) remain the recommended screening strategy [11]. Although CMR is expected to detect a higher prevalence of myocardial damage in the sarcoidosis population, clinical implications for an asymptomatic patient without rhythm or morphological abnormalities remain unclear. On the other hand, CMR was strongly recommended as the first-choice imaging modality in patients with suspected CS patients with cardiac symptoms and/or ECG abnormalities.

In this issue of the *Kardiologia Polska* (*Polish Heart Journal*), we read with interest the article regarding the role of CMR in the asymptomatic sarcoidosis population, which aims to shine light on the use of CMR in a subclinical setting [12]. In a cohort of 55 sarcoidosis patients with evidence of extra-cardiac disease, CMR managed to detect only 6% of cardiac involvement when used as a screening tool. None of the patients had cardiac symptoms, while all patients had no significant ECG abnormalities or morphological abnormalities on echocardiography or CMR at baseline. In addition, none of the patients was found to have elevated cardiac biomarkers such as troponin or BNP. Therefore, CS was an incidental finding in this population. No follow-up data were provided to evaluate the prognostic role of CS in this group of patients. A similar prevalence of CS (13%) was reported in a cohort of 61 Japanese sarcoidosis patients without any cardiac manifestations of CS [13]. In that study, the detection of LGE was not associated with any adverse events during follow-up. In a larger cohort of patients with extra-cardiac disease demonstrated by biopsy, CMR detected approximately 20% of CS in a subclinical

setting (lack of cardiac symptoms and/or ECG abnormalities) [3]. However, LGE on CMR was not associated with major adverse events during follow-up in the patients with subclinical disease in that study [3].

Current literature indicates that CMR has high sensitivity and specificity in identifying patients with CS and particularly those at higher risk of major arrhythmias during follow-up. CMR has clear superiority in evaluating cardiac morphology, in particular myocardial fibrosis, which has greater prognostic value than any other imaging modality in current use. In the study by Kouranos et al. [3], CMR was found to be superior to conventional tests such as 12-lead ECG, Holter monitoring, echocardiography, or a combination of those. What becomes crucial is identifying which suspected sarcoidosis patients should undergo CMR. Kysperska et al. [12] showed that it is unlikely to detect CS in the asymptomatic population without ECG or echocardiographic abnormalities, supporting the current guideline recommendations. However, we should acknowledge that the authors performed a comprehensive baseline assessment with all conventional tests such as 12-lead ECG, Holter monitoring, and echocardiography, as well as biomarker testing outside the guideline recommendations.

We support the measurement of serum biomarkers, such as NT-proBNP, and echocardiography for screening the sarcoidosis population. Modern echocardiographic techniques, such as speckle tracking, have been shown to be more sensitive in detecting myocardial involvement than conventional echocardiographic modalities. Such an approach in addition to the current strategy of assessment of cardiac symptoms and ECG abnormalities should be able to identify a higher number of patients suspected of CS. BNP and NT-proBNP are associated with both left and right ventricular strain, even at an early stage, and have been linked with CS [14]. Speckle tracking analysis is an echocardiographic technique that measures myocardial deformation and may be able to detect cardiac involvement of sarcoidosis earlier than conventional echocardiographic modalities [15]. In addition, regional wall motion abnormalities appear to be strongly associated with CS, which should be part of the routine echocardiographic assessment [15]. Finally, there was a weak association between elevated angiotensin converting enzyme levels and CS detection in the latest study presented in this issue of the *Kardiol Pol* [12]. This would raise suspicion as to whether the clinical impression of disease activity should be included in the screening strategy, and it should indicate the performance of CMR as a screening test. Further studies are warranted to identify the optimal screening strategy for CS. The association of CS with sudden cardiac death and high morbidity and mortality requires early and accurate diagnosis.

Article information

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