Pericarditis or myocarditis: still a clinical problem

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Abstract
Pericarditis and myocarditis are diseases of a similar etiology and clinical image, and they often overlap. Depending on the clinical manifestation, there is pericarditis with simultaneous involvement of the heart muscle (myopericarditis), or myocarditis with pericardial involvement (perimyocarditis). The paper presents a case of a young patient with myopericarditis, with attention to the electrocardiographic image and parameters of myocardial damage.
Key words: myopericarditis, troponins, electrocardiogram

Introduction
The pericardium, a loose-fitting structure surrounding the heart, consists of two layers, i.e. an inner layer — serous one (epicardium), which adheres to the cardiac muscle, and an outer layer — fibrous. Physiologically, between these layers there is friction-reducing fluid (10–50 mL). The most common, especially among young adults, disorder of pericardium is acute pericarditis. For the diagnosis of pericarditis, at least 2 of 4 criteria must be met: 1) pericardial chest pain, 2) pericardial friction rub, 3) characteristic changes in the normal electrocardiogram (ECG) pattern (newly detected ST elevations or PR depressions in multiple leads, in an acute phase of the disease), 4) presence of increased pericardial sac fluid found on echocardiography [1, 2].

Myopericarditis means pericarditis with a certain degree of coexistent myocarditis. Due to similar etiology of pericarditis and myocarditis, as well as anatomical proximity, overlapping of clinical pictures for both diseases is frequently observed in daily practice. The diagnosis of myopericarditis concerns the situation in which the symptoms of acute pericarditis predominate and there is also an increase in the levels of cardiomyocyte injury markers, but with no signs of fresh focal or diffuse left ventricular dysfunction. To make a diagnosis of perimyocarditis, on the other hand, it is necessary to find the above-mentioned abnormalities on echocardiography or magnetic resonance imaging in a patient who also meets the criteria for the diagnosis of acute pericarditis [1, 2].

Case study
A 21-year-old man — previously healthy — with suspected pericarditis was referred in February 2020 to the Department of Cardiology, Interventional Electrocardiology and Hypertension of the University Hospital in Krakow from the emergency department for further diagnosis and treatment. The reported symptoms included crushing chest pain lasting from about three weeks — initially right side pain, then (from about a week) left side pain, radiating to the left subscapular region. The pain occurred periodically, slightly intensified during inspiration and changing a body position (up to 6/10 points in Numeric Rating Scale [NRS]). Slight dyspnea occurred during physical effort. Furthermore, three weeks earlier, the patient reported an infection of the upper respiratory tract with severe symptoms such as sore throat, coughing, hoarseness and fever. The infection was not treated pharmacologically, and its symptoms almost disappeared.
in Figure 2. It was recommended to limit physical activity for 3 months after discharge.

Discussion

As mentioned, acute pericarditis can coexist with myocarditis (two possible forms of the disease: myopericarditis or perimyocarditis). Moreover, in the case of acute pericarditis, the pericardial sac fluid does not necessarily have to be present [1]. This was the case here—both above-mentioned anatomical structures were simultaneously infiltrated with a trace amount of fluid in the pericardial cavity.

The most common cause of pericarditis in industrialized countries is infection with cardiotropic viruses, while in developing countries other infectious agents, such as tuberculosis, are more common. Other causes of pericarditis are autoimmune disorders, metabolic diseases, traumas, cancers, myocardial infarction [1]. The patient was treated as a case with the primary problem in the form of acute pericarditis of most likely viral etiology. Two out of
The clinical diagnosis of myopericarditis in this study was confirmed by i.a., increased levels of myocardial necrosis markers. In the patient described by us, 4 out of 5 above-mentioned elements of the clinical picture, which increase the chance of myopericarditis diagnosis, occurred. In the course of pericarditis, inflammatory markers [C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), leukocyte count] are also elevated [1, 2].

ST segment elevation in many leads with frequently accompanying PR segment depressions is a typical symptom of acute pericarditis. Such changes are found in approximately 60% of patients. Changes in ECG represent an inflammatory reaction of the inner pericardial layer (epicardium) because the fibrous pericardium does not show any electrical activity. Depending on the degree of myocardial involvement, standard changes may coexist with diffuse changes in the T-wave, including their inversions [1, 4]. In the patient in question, ST segment elevations were present in many leads which did not form any pattern typical of occlusion of one of the epicardial arteries. The enclosed electrocardiogram (Figure 1) is similar to other ones recorded in patients with myopericarditis [4, 5]. The literature also contains case studies of patients with ECG changes that suggested the occlusion of one of the epicardial arteries, which led to performing coronary angiography that showed no significant lesions in coronary vessels [6–8].
To sum up, in patients with risk factors for atherosclerosis of the blood vessels, pericardial syndromes may be confused with acute coronary syndromes. They should also be differentiated from early repolarization syndromes (similar electrocardiographic pattern). Patients with pericarditis usually report chest pain of pericardial nature. Fever and dyspnea are prevalent. Laboratory tests show elevated inflammatory markers. In patients with myocarditis, myocardial necrosis markers are also elevated. Echocardiography is very helpful in making a proper diagnosis. The patients with dominant signs of pericarditis (myopericarditis) are treated with nonsteroidal anti-inflammatory drugs in high doses, usually in combination with colchicine [1].

Conflict of interest

The authors declare no conflict of interest.

References