Atrial fibrillation (AF) and chronic coronary syndrome (CCS) share common risk factors. In addition, inflammation plays a causative role in those diseases. Atrial fibrosis due to atrial ischemia and elevated left atrial filling pressures also link AF and CCS. Moreover, CCS accompanied by unhealthy lifestyle and risk factors may lead to atrial remodeling/cardiomyopathy and AF. However, it is still unclear whether coronary artery disease is the precursor for AF, or whether they have the same causal pathway.

Patients with angina and nonobstructive coronary lesions seem to have an increased risk of adverse clinical events. They also tend to be underdiagnosed and undertreated. Moreover, they undergo numerous diagnostic tests with repeated coronary computed tomography angiography (CTA) or invasive coronary angiography (ICA), which may contribute to elevated healthcare costs. Unfortunately, some difficulties with qualifying AF patients for invasive evaluation of CCS are evident. A significant discrepancy between findings associated with coronary anatomy, the results of noninvasive tests and the presence of symptoms is common in clinical practice. During AF, chest pain accompanied by ST-segment depression and marginally elevated biomarkers of myocardial injury may mimic coronary artery disease. Suboptimal ventricular rate control during AF may worsen symptoms of myocardial ischemia. However, no strong association was showed between transient ischemic-type ST-segment depression during episodes of AF and underlying occult CCS.

Some studies demonstrated that AF episode induces an increase in coronary flow inadequate to meet myocardial oxygen demand, as well as an exaggerated drop in coronary vascular resistance. In addition, coronary vasoconstriction may be responsible for obstruction of coronary blood flow.

In one study, patients older than 40 years with AF of recent onset and temporary ischemic-type ST-segment depression who had no history of coronary artery disease, other cardiac disorders or severe comorbidities were assessed. Intima-media thickness of 0.93 mm or greater and highsensitivity C-reactive protein of 4.65 mg/l or greater were predictors of obstructive coronary artery disease in those patients.

In the current issue of *Polish Archives of Internal Medicine* (Pol Arch Intern Med), Tomaszuk-Kazberuk et al showed findings regarding whether a history of AF is related to the absence of significant coronary lesions on coronary angiography. The authors presented data from one tertiary center and analyzed retrospectively data of 8288 patients admitted for coronary angiography because of exacerbated angina from 2007 to 2016. They concluded that in patients qualified for invasive CCS diagnostic workup, AF was associated with the absence of significant coronary lesions on angiography and less common need of revascularization. Diagnostic difficulties included multiple factors, such as: symptoms of AF imitate CCS, ischemic changes on electrocardiogram during AF suboptimally predict obstructive CCS, stress tests are infrequently performed in AF patients, and rapid rhythm is associated with difficulties in the interpretation of coronary CTA findings. The study limitations included: underpowered group of AF patients who were less likely to have lipid disorders, observational, retrospective, single-center study and not performing of fractional flow reserve on a regular basis. The more frequent use of fractional flow reserve would enable more accurate evaluation of the significance of a coronary stenosis with an angiographic severity of 50% to 70%. Other limitations concern: lack of possibility to reliably evaluate stress tests, no solid data on smoking, and no data on newly-diagnosed AF.

In one study, coronary artery calcium tended to be highly prevalent in patients with AF, irrespective of major cardiovascular risk factors and gender. The innovative program to evaluate
the coronary artery calcium from computed tomography angiography, which was used in the above study, provided optimal image quality for coronary artery calcium assessment in 96% of the cases. This method also reduced the need for additional imaging and minimized the radiation hazard for patients.

The available common noninvasive methods evaluating ischemia rely on detection of substantial regional differences in wall motion in epicardial perfusion territories or left ventricular perfusion (ie, dobutamine stress echocardiography). If ischemia is associated with the whole left ventricle, these techniques are ineffective. Despite the constant progress in medicine, there is no method which allows a direct anatomical imaging of the coronary microcirculation in vivo in humans. As a consequence, patients with AF and CAD may be sometimes not correctly diagnosed which, in turn, may lead to repeated hospitalizations and unnecessary coronary angiography.

Current data indicate that patients with AF and CAD remain a challenge. Thus, future research should concentrate on further risk stratification as well as diagnostic strategies in those patients.

ARTICLE INFORMATION

DISCLAIMER The opinions expressed by the author are not necessarily those of the journal editors, Polish Society of Internal Medicine, or publisher.

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