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Editorial

Commentary on Coronary Lesions in Patients with Atrial Fibrillation

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Recently, Chen *et al.* published an interesting study titled "Coronary Lesions in Patients with Atrial Fibrillation: A Retrospective Study,"[1] which was included in the most recent volume of *Exploratory Research and Hypothesis in Medicine*. This retrospective study was carried out at the Fourth Affiliated Hospital of Zhejiang University School of Medicine between October 2015 and October 2019. It included 89 patients diagnosed with atrial fibrillation (AF) and coronary artery lesions compared with 160 patients who also had coronary artery lesions, but without AF (main group and comparison group, respectively). The researchers tried to determine if AF is related to the precise location of a given coronary artery lesion. The aim of the study caught my attention because it focused on two significant cardiovascular diseases (AF and coronary artery disease [CAD]), which may coincide in the same patient and add morbidity, although not always due to cause and effect. Thus, this exciting proposal and working hypothesis have been well developed and explained. Today, we know that AF is the most frequent cardiac arrhythmia, and it is already considered a global public health problem. Atrial fibrillation has been related to five times greater risk of cerebrovascular accident, a 3.4 times greater risk of heart failure, and two times greater risk of dying than patients with sinus rhythm. It has also been associated with a greater risk of developing cognitive impairment, probably related to cerebral microemboli, and a worse quality of life.[2] Therefore, it is crucial to be aware of the pathophysiological mechanisms and risk factors that have been related to or identified in the development of AF.

On the other hand, regarding the analysis of the most up-to-date epidemiological data from the Global Burden of Disease,[3] we also know that CAD is estimated to affect approximately 126 million individuals (1,655 per 100,000), which is roughly 1.72% of the world's population, being responsible for nine million deaths, globally.[4] Currently, we know that the population of patients with both CAD and AF is growing. These diseases have several shared risk factors which foster their development and potentiate their effects. Concerning coronary ischemia, animal experiments have shown that the occlusion of an atrial coronary artery increased the duration of burst pacing-induced AF.[5] Based on these and other experimental observations, it has been hypothesized that atrial ischemia caused by stenosis of the vessels which irrigate the atria is associated with the development of AF. CAD causes myocardial ischemia, heart failure (HF), mitral regurgitation, atrial dilatation and AF development. CAD can directly promote the progression of AF by affecting the occurrence of reentry, focal ectopic activity, and neural remodeling. Atrial fibrillation is also known to increase the burden of CAD through the development of atherosclerosis, the mismatch between blood supply and oxygen consumption, and thrombosis.[6] Thus, it is interesting to determine the relationship between AF and CAD in this study. In the current study, the groups (main and comparison), selected according to the criteria established by the researchers, were very homogenous, which allowed for a good comparison. It is noteworthy that the population was in the sixth decade of life, which is very common for AF and CAD to develop. The two key points, determining the presence of CAD and AF, were based on standard and precision tests (coronary angiography and Holter monitoring) methodically performed in both groups. Although this study shows a negative result, not finding AF to be secondary to focal coronary artery lesions, it triggers curiosity for further research into the AF mechanisms. This research could include more advanced studies of atrial function analysis (for example, atrial strain), invasive electrophysiology studies correlated with stenotic coronary arteries and ischemic areas detected. The study's limitations include being performed at a single center, being a retrospective study with a small sample, not relating medical treatment with the variables, and not determining the functional coronary flow reserve. The results only portray the situation of a small group of patients. This type of research should be designed as prospective, multicenter, randomized trials, using a representative number of patients, to provide more concrete results which can be compared with other populations.

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Abbreviations: AF, atrial fibrillation; CAD, coronary artery disease.

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Conflict of interest

The author has no conflicts of interest to declare.

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