More than two-thirds of endomyocardial biopsies show cardiotropic virus, German researchers find.

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VANCOUVER, B.C. — Mounting evidence points to a greatly expanded role for viral myocarditis as a cause of heart failure, other comorbid illnesses, medications, and/or contribute to development of a chronic inflammatory state—all of which could cause destruction of the myocardium and ultimately heart failure, he explained.

Viral genomes were amplified from the endomyocardial biopsies of 67% of the 245 patients. Topping the list was parvovirus B19, present in 51% of biopsies, followed by human herpesvirus 6 in 22%, enterovirus in 9%, Epstein-Barr virus in 2%, adenovirus in 1.6%, and cytomegalovirus in fewer than 1%. Of note, 27% of patients had multiple myocardial viral infections.

All participants in this study had undergone angiography and echocardiography to exclude coronary artery disease, valve disease, and hypertension as causes of their LV systolic dysfunction.

In a similar study conducted by the German investigators in 37 patients with isolated LV diastolic dysfunction, 35% had endomyocardial biopsies that proved positive for cardiotropic viral genomes. Parvovirus B19 was present in 8 of the 35.

In both studies, viral RNA was detected in LV myocardium of patients who had atrial fibrillation, stroke, and other adverse outcomes. In the BICC study, 22% of patients demonstrated improved LV function.

The study casts a wider net and used state-of-the-art methods in the search.

Dr. Pauschinger and colleagues prospectively followed a group of patients with myocardial viral infection and dilated cardiomyopathy. Those who experienced spontaneous elimination of their viral infections showed a significant increase in LV ejection fraction; those with persistent viral infection did not.

On the treatment front, a phase III randomized clinical trial of interferon β in dilated cardiomyopathy patients with evidence of persistent viral infection is planned for the United States and Japan.

By year’s end, results of the phase II randomized placebo-controlled study Betaferon in Chronic Viral Cardiomyopathy (BICC), a multicenter trial in which Dr. Pauschinger was an investigator, should be available.

BICC was an outgrowth of an earlier pilot study conducted by the Berlin group. The pilot study involved 22 consecutive patients with a 44-month history of symptomatic LV dysfunction and myocardial enterovirus or adenovirus infection proved by polymerase chain reaction.

In a study conducted by human herpesvirus 6, 6% human cytomegalovirus, herpes simplex virus, Epstein-Barr virus, and influenza A and B.

There is good reason to believe these viruses are not innocent bystanders in the myocardium of patients with dilated cardiomyopathy.

Some of the viruses have direct cytopathic effects. Others have been shown to induce immune or autoimmune reactions, cause endothelial dysfunction, stimulate chronically increased expression of cytokines, and/or contribute to development of a chronic inflammatory state—all of which could cause destruction of the myocardium and ultimately heart failure, he added. He and his coinvestigators detected evidence of persistent viral infection in more than two-thirds of endomyocardial biopsies obtained from 245 consecutive patients with idiopathic left ventricular (LV) systolic dysfunction.

This is a much higher prevalence than had been previously reported by others, probably because investigators in this study cast a wider net and used state-of-the-art polymerase chain reaction methods in the search.

Other studies looked chiefly for enterovirus and adenovirus in the myocardium. Dr. Pauschinger and his coworkers screened for a broader spectrum of cardiotropic viruses, including not only adenovirus and enterovirus but also parvovirus B19, human herpesvirus 6, human cytomegalovirus, herpes simplex virus, Epstein-Barr virus, and influenza A and B.

It also adds to a growing body of evidence pointing to a greatly expanded role for viral myocarditis as a cause of what has traditionally been classified as ‘idiopathic’ dilated cardiomyopathy, Matthias Pauschinger, M.D., said at a meeting sponsored by the International Society of Cardiology.

This revised conception of the pathogenesis of a surprisingly large percentage of dilated cardiomyopathies may lead to earlier diagnosis of this disease, a prospective study has shown.

Systolic dysfunction was found in 3.3% of the 245 patients whose left atrial function index was in the lowest quartile and cardiovascular death rates were 1% with no plaques, 6% with up to two plaques, and 19% of people with more than two plaques. In women, the cardiovascular mortality rate at 10 years was 4% in those with no plaques at baseline, 7% in those with up to two plaques, and 25% in those with more than two plaques.

In men, the cardiovascular mortality rate at 10 years was 4% in those with no plaques at baseline, 7% in those with up to two plaques, and 25% in those with more than two plaques.

Gender and smoking status did not alter the relationship between carotid artery plaque burden and cardiovascular death.

The study suggests that carotid artery plaques are another risk factor that might be assessed in deciding whether and how aggressively to treat patients with high blood pressure, Dr. Christensen said in an interview during the poster session.

Conventional risk factors such as age, cholesterol, and smoking status provide plenty of information to guide management in most patients, but carotid ultrasound might be worth the added expense to look for plaques in borderline patients, he said.

The presence of plaques was linked to a 57% increase in the risk of cardiovascular death over the 10-year period after adjustment for conventional risk factors.