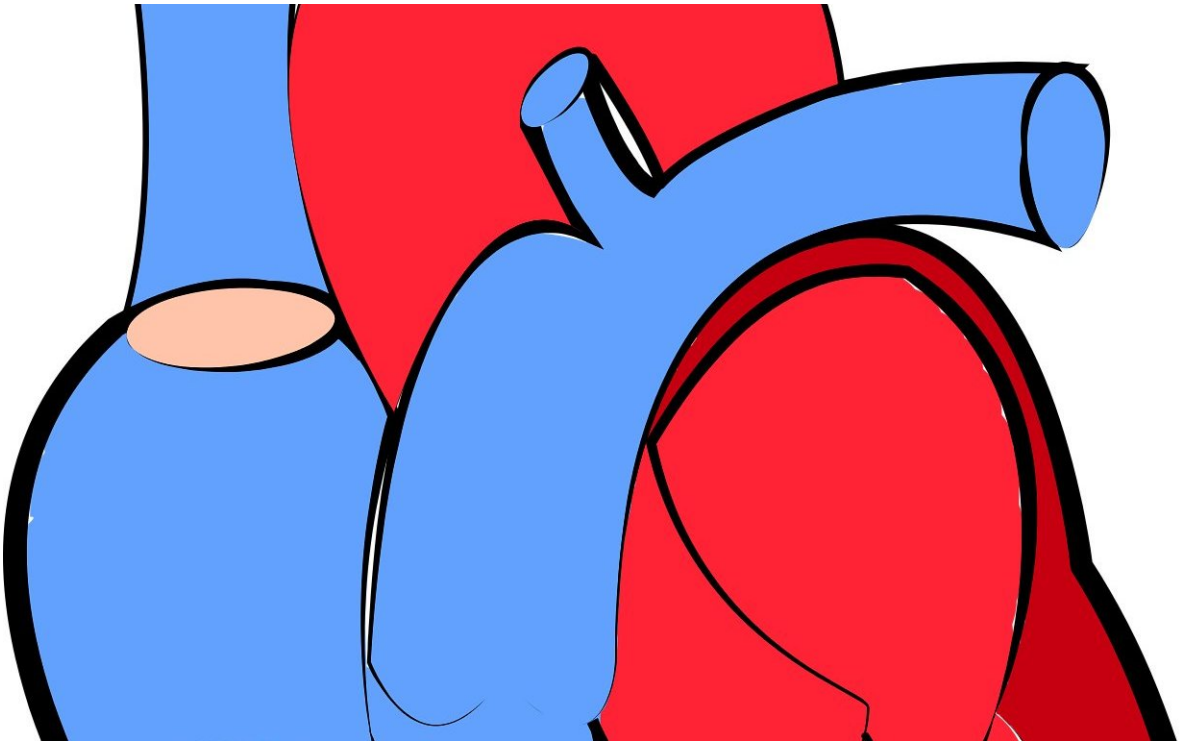
Beta blocker use identified as hospitalization risk factor in 'stiff heart' heart failure

December 4 2019



Credit: CC0 Public Domain

Nearly six million Americans have heart failure, a leading driver of health care costs in the United States. The "stiff heart" heart failure variant accounts for about half of all cases and the vast majority of such patients take beta-blocker medications despite unclear benefit from their regular use. A new publication in *JAMA Network Open* links use of beta-

blockers to heart failure hospitalizations among those with this common "stiff heart" heart failure subtype.

Heart failure occurs when the heart cannot meet the body's demands. About half of patients have heart failure characterized by a normal squeeze but impaired relaxation of the heart muscle from a "stiff heart". This is also known as heart failure with preserved ejection fraction. The other half of cases are due to a "weak heart" with an abnormal squeeze, also known as heart failure with reduced ejection fraction. Beta-blockers—medications that lower the heart rate and blood pressure—are strongly recommended in national guidelines for treatment of "weak heart" heart failure because of their clear benefit.

"A big problem with 'stiff heart' heart failure is that we don't have effective medical therapies," says coauthor Timothy Plante, M.D., an assistant professor of medicine at the Larner College of Medicine at the University of Vermont. "So, instead, we use the same medications that work for 'weak heart' heart failure. Because beta-blockers save lives in 'weak heart' heart failure, we assume they are also effective in 'stiff heart' heart failure patients—this assumption may be wrong."

Plante, lead author Daniel Silverman, M.D., senior author Markus Meyer, M.D., and colleagues analyzed data from the National Institutes of Health-funded TOPCAT (Treatment of Preserved Cardiac Function Heart Failure with an Aldosterone Antagonist) study, a trial of the medication spironolactone in patients with "stiff heart" heart failure. About four out of five study participants were on beta-blockers.

The researchers found beta-blocker use to be a risk factor for hospitalizations for heart failure among these patients with "stiff heart" heart failure.

"Beta-blocker use was associated with a 74 percent higher risk of heart

failure hospitalizations among participants with heart failure and a normal pump function," says Meyer, an associate professor of medicine at the University of Minnesota Medical School.

Despite their common use, the authors note that beta-blocker use in "stiff heart" heart failure has not been sufficiently studied. This publication extends their prior work, which found that halting beta-blockers markedly improves levels of the heart failure blood test known as BNP among patients with "stiff heart" heart failure.

"In 'stiff heart' heart failure, the heart is less able to relax and fill with blood. Beta-blockers appear to increase pressures inside the heart. This may lead to symptoms like worsening shortness of breath and retention of fluid," says Silverman, a cardiology fellow and clinical instructor in medicine at the University of Vermont Medical Center and Larner College of Medicine.

"Even people without heart failure will have more shortness of breath and less exercise capacity. This has been a known class side effect for decades," says Meyer. "It is important to understand that our findings are not proof that beta-blockers are harmful among patients with 'stiff heart' heart failure—it is just a concerning signal."

They believe their findings warrant a clinical trial to evaluate the safety and effects of beta-blockers in patients with "stiff heart" heart failure. "There are some big next steps, like reproducing this finding in other studies and testing if there is a benefit of stopping beta-blockers in patients with 'stiff heart' heart failure," says Silverman.

Provided by University of Vermont

Citation: Beta blocker use identified as hospitalization risk factor in 'stiff heart' heart failure