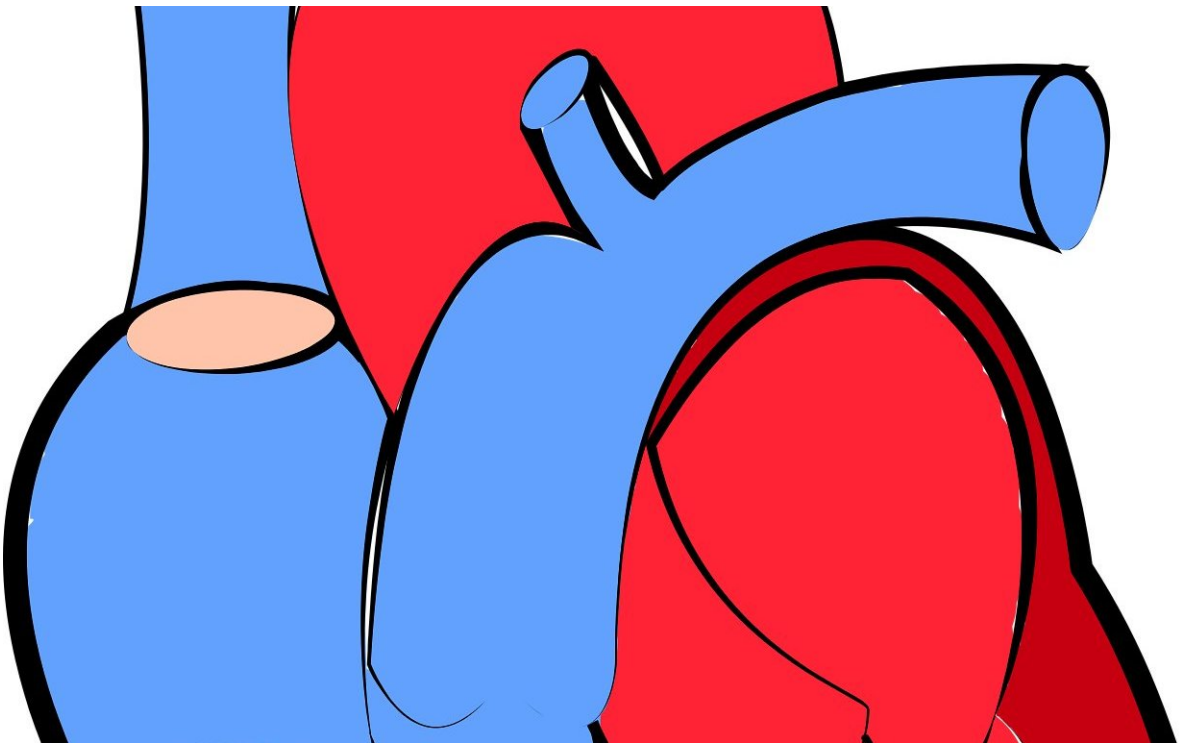
Preventive drug therapy may increase right-sided heart failure risk in patients who receive heart devices

June 11 2019



Credit: CC0 Public Domain

Patients with left-sided heart failure who get implanted devices to improve the pumping of their hearts may be more likely to develop heart failure on the opposite side of their hearts if they are pre-treated with off-

label selective vasodilator drugs, according to new research published in *Circulation: Heart Failure*, an American Heart Association journal.

Between 10% and 40% of patients who undergo left-ventricular assist device (LVAD) implantation for left-sided heart failure develop right-sided heart failure—a complication that spells worse outcomes. To head off the complication, physicians sometimes prescribe preemptive treatment with off-label selective vasodilator drugs called phosphodiesterase-5 inhibitors (PDE5i). PDE5i drugs are currently approved for use to avoid right heart failure in patients with pulmonary arterial hypertension due to causes other than heart disease, which is a different patient group from the ones followed in this study.

PDE5i drugs dilate the pulmonary artery—the large vessel that carries blood away from the heart's right side and into the lungs. A handful of small studies have shown a possible benefit to this off-label approach in some patients but affirmative data from large-scale studies have been lacking and the current study hopes to help close this gap.

An LVAD is a mechanical heart pump. It's placed inside a person's chest, where it helps the heart pump oxygen-rich blood throughout the body. Unlike an artificial heart transplant, LVADs do not replace the heart. LVADs help the heart do its job.

The findings of the new study—the largest analysis to date to assess the utility of this approach—call the preemptive treatment with PDE5i drugs into question.

"We found no benefit of this therapy in patients receiving LVAD devices, including patients with pulmonary vascular disease or right ventricular dysfunction—the very patients who might be expected to benefit most," said study senior investigator Michael Kiernan, M.D., M.S., a cardiologist at Tufts Medical Center and assistant professor of

medicine at Tufts University School of Medicine in Boston. "Our findings should give pause to clinicians considering this therapy, and we would caution against routine use of these therapies prior to LVAD surgery."

The results are based on analysis of 11,544 U.S. LVAD recipients who underwent implantation between 2012 and 2017. Of all device recipients, 1,199 (10%) received pre-implantation treatment with PDE5i drugs which target the pulmonary artery to reduce the pressure in the heart's right ventricle. Overall, 24% of all patients who got LVAD implants developed right-sided heart failure, but the group that got pre-implantation drugs did so at higher rates. To minimize the possible effects of other factors that could bias the outcomes, the researchers matched 1,177patients treated with PDE5i drugs to group of 1,177 patients who did not receive such preventive therapy but were otherwise similar to the pre-treated group in terms of disease severity, age and the presence of other diseases that could affect outcome and health status.

Compared with those who did not get drug therapy, the group that received vasodilator drugs before LVAD implantation were 31% more likely to develop right-sided heart failure (29% for those treated, compared with 24% among those who did not receive pre-treatment). Additionally, the relative risk of bleeding within a week of LVAD surgery was 46% higher in patients receiving PDE5i therapy (12% of patients receiving therapy versus 8% of those not receiving this therapy), the analysis showed.

More information: *Circulation: Heart Failure*, DOI: 10.1161/CIRCHEARTFAILURE.118.005537

Provided by American Heart Association