Beta Blockers vs. ACE Inhibitors: Which Are Better for People With HIV?

New research suggests that one type of blood pressure treatment trumps the other, but more data are needed.

May 18, 2021 By Heather Boerner

New data published in the journal Hypertension suggest that beta blockers may not be as well equipped to address cardiovascular disease among people living with HIV as other blood pressure treatments, like ACE inhibitors or calcium channel blockers.

Cardiovascular disease affects people living with HIV at a higher rate than the general public, and both HIV itself and HIV medications can increase the risk for heart disease. High blood pressure (hypertension) can lead to such health problems as heart disease and strokes. Various types of medication are used to control blood pressure, but little research has been done on how well they work for people with HIV.

To figure that out, Leah Rethy, MD, of the University of Pennsylvania, and colleagues examined the medical records of 8,041 veterans living with HIV who were part of the Antihypertensives in Obesity Management study between 2000 and 2019. The researchers determined which hypertension medicines the participants were on and how likely they were to have a heart attack, heart failure or other cardiovascular problems based on their heart disease medication regimen.

The participants were almost all men (97%), and 49% were Black. The mean age was 53 years. Nearly a quarter (24%) were started on an ACE (angiotensin-converting enzyme) inhibitor or ARB (angiotensin receptor blocker), 23% on thiazide or similar diueretics, 13% on a beta blocker and 11% on a calcium channel blocker.

Across the hypertension treatment arms, about a quarter of the participants were not on antiretroviral (ARV) therapy. The type of ARVs varied by year; nonnucleoside reverse transcriptase inhibitors (NNRTIs) were the most commonly prescribed at the start of the study, and integrase inhibitors topped the list by the end of the study period. Among those with CD4 counts available, immune function was generally good: CD4 counts ran in the 400s in all treatment arms.

Perhaps not surprisingly, it appeared that participants were put on different hypertension medications based on symptoms, coexisting conditions or type of ARVs. People with hepatitis C, those on NNRTIs and those with viral damage to the kidneys were more likely to be prescribed ACE

inhibitors or ARBs. Those with metabolic changes ,like lipodystrophy, insulin resistance or salt sensitivity, were given ACE inhibitors, ARBs or thiazide diuretics. And those with persistent inflammation, reduced nitrous oxide in their blood and atherosclerosis received ACE inhibitors, ARBs, calcium channel blockers or beta blockers.

Over a median follow-up time of 6.5 years, one in four participants had a cardiovascular incident, which included heart attack, stroke or congestive heart failure, and 27% overall died during the study period. When the researchers narrowed the participants down to those without indications for cardiovascular disease at the start of the study, they found that 22% developed heart disease, and, again, about one in four died.

When they broke down the events and deaths by treatment time, they found that those receiving beta blockers were 79% more likely to have a cardiovascular event and to die than those taking ACE inhibitors or ARBs. And those on beta blockers were 90% more likely to experience a heart attack than peers on ACE inhibitors or ARBs. Those taking calcium channel blockers had about the same risk for cardiovascular events and death as those taking ACE inhibitors or ARBs, with a 3% reduction in the risk for heart failure among those on calcium channel blockers.

Overall, ACE inhibitors and ARBs were associated with a 29% decrease in the risk for cardiovascular disease or death, a 24% reduction in Leah Rethy, MD, of the University of Pennsylvania the risk for heart attacks and a 33% reduction in the risk for heart failure compared with beta blockers—and this was after adjusting for other chronic health conditions, ARV drug class, smoking and other risk factors. Calcium channel blockers did slightly better still, and thiazide diuretics lowered the risk even further.

Interestingly, Black participants were less likely to be prescribed the beta blockers associated with the highest mortality and more likely to be prescribed calcium channel blockers. However, the study found that non-Black participants had higher rates of cardiovascular events and death with calcium channel blockers or thiazide diuretics than their Black peers.

It’s unclear why beta blockers were associated with higher rates of cardiovascular events and death, Rethy and colleagues wrote, but it could be related to the interaction between beta blockers, HIV pathophysiology and ARVs. On the one hand, it may be that the decreased insulin sensitivity and weight gain associated with beta blockers play into metabolic issues that result from some ARVs, making heart disease more likely. On the other hand, it may be the impact of inflammation related to HIV, which beta blockers just can’t address. In particular, inflammation may contribute to endothelial dysfunction, in which the inner lining of arteries does not work properly.

“Most beta blockers have not been shown to have a beneficial effect on endothelial function (in contrast to ACE inhibitor/ARBs) and [cardiovascular disease] in [people with HIV] appears to be driven, at least in part, by endothelial dysfunction related to chronic inflammation and immune dysregulation,” they wrote. “By not modifying endothelial dysfunction, hypertension management with beta blockers (compared to ACE inhibitor/ARBs) may miss a key noxious pathway related to

both hypertension and [cardiovascular disease] and thus contribute to an increased risk of [cardiovascular disease].”

Click here to read the study abstract.
