Common drug a detriment for patients with lung condition PAH

April Hudson

Patients with high blood pressure in their lung arteries can breathe easier now that scientists have identified a previously undiscovered side effect to a commonly used medication.

The condition, Pulmonary Arterial Hypertension (PAH), is already a dangerous one to be diagnosed with, and is often treated through a drug known as an endothelin receptor antagonist (ERA), which works to block the effects of endothelins on the lungs, which causes lung arteries to tighten more. However, a research team at the University of Alberta has unearthed a negative effect of the antagonist, which can pose a very real danger to a patient’s heart.

“The endothelin receptor is also expressed to the tissue of the heart muscle — specifically the right ventricle, which actually pumps blood to the lungs,” explained cardiologist Ryan Nagendran.

“So it’s the right ventricle that struggles when you have pulmonary arterial hypertension, because it is struggling to pump blood into the lungs when the arteries are tightened. By this medication also blocking the effects of endothelins on the heart, it actually causes the heart to contract less well — so despite the medication doing something positive in the lungs... it can have a counterbalancing or negative side effect by causing the heart muscle to contract less well.”

Nagendran said this explains the first time why some patients being treated for PAH who are given the medication don’t experience any improvement, and in some cases may get worse.

“They continue to have symptoms of shortness of breath and even symptoms of heart failure, where they develop swelling in the legs, or what we call edema,” he said.

“That could potentially be attributed to some of these direct effects on the heart medication, despite it doing something good in the lungs.”

“In the past, we might have just tried to treat swelling with diuretics or water pills to try to remove that fluid. Now we are more attuned to saying we should potentially cut back this medication.”

SAYRA NAZARUDIN

Nagendran joined the group re-searching PAH in 2005 under the leadership of cardiologist Evangelos Michalis. Together with a team of surgeons, cardiologists, physicians, pathologists and scientists they brought their findings into the lab, where they had access to heart tissue and could perform tests. These tests provided proof of their suspicions — although blocking endothelins wasn’t significantly impact normal hearts, PAH patients with thickened right ventricles were exposed to a higher level of risk.

Nagendran said the findings were only possible due to the multidisciplinary nature of the team involved.

“As clinicians, we’re able to ask these questions that are directly affecting our patients. Because we’re also scientists, we’re able to take that back to the lab to try and analyze that in tissue,” he explained.

Although not all patients taking ERAs experience serious side effects, Nagendran said physicians now need to be aware that those who do have side effects such as swelling could be having them as a result of the medication.

“In the past, we might have just tried to treat swelling with diuretics or water pills to try to remove that fluid,” he said.

“Now we are more attuned in saying we should potentially cut back this medication — or in severe cases, discontinue it — because of the side effects.”

Nagendran said the difference between PAH and regular hypertension is that patients with the latter, where blood pressure is generally high in their body, can continue to live for decades.

“When you’re diagnosed with a high blood pressure in the lung arteries, your life expectancy... is in the two to three year range. So five year patients with medication that could potentially worsen their prognosis or symptoms it could have dangerous effects on their outcomes,” he said.

Funded in part by the Mazankowski-Alberta Heart Institute, part of the University Hospital Foundation, this study came out in the journal Circulation Research on Jan. 18.

The girl behind me in class keeps touching my hood. #pleasestop #ualberta #getyourownhood

We don’t just own hoods at The Gateway — we are the hood.