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# Blood pressure drug telmisartan shows powerful activity against stroke

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Telmisartan, a drug widely used to help control blood pressure, may have uniquely potent activity in preventing stroke, according to a new study conducted in an animal model.

Whether they used the drug alone or in combination with a different type of antihypertensive medication, ramipril, Weill Cornell Medical College researchers found that rats fed a high-salt, stroke-inducing diet were completely protected from the brain attacks while on telmisartan.

"No other study has ever shown complete protection against stroke in this rat model using normal human drug doses" notes study senior author Dr. Daniel F. Catanzaro, professor of physiology and biophysics and professor of physiology in cardiothoracic surgery at Weill Cornell Medical College.

The study, which was funded by telmisartan's German maker, Boehringer Ingelheim Pharma GmbH & Co., is published online in the Journal of the American Society of Hypertension.

Telmisartan (brand name Micardis) is one of a class of widely used antihypertensive drugs known as angiotensin receptor blockers (ARBs). "These drugs primarily act on the vasculature to relax the small blood vessels," Dr. Catanzaro explains.

Telmisartan stands out from other ARBs in that its molecular structure allows it to more easily pass through the blood-brain barrier and enter

the brain -- something many drugs cannot do.

The new animal study was not constructed to specifically look at telmisartan's effect on stroke. "Because blood pressure is closely related to stroke risk, we really just wanted to look and see if combinations of antihypertensive drugs were better at lowering blood pressure and stroke compared to the use of single agents," Dr. Catanzaro explains.

In this case, his team tested two drugs -- telmisartan and an ACE inhibitor, ramipril (Altace) -- in a rat model long favored by stroke researchers. In this approach, rats are fed what's known as a "stroke-prone diet," meaning they get lots of salt in both their food and water.

"This rat model has been great at showing us the neuroprotective properties of different drugs in the past, and the results usually correlate with results in humans," Dr. Catanzaro says.

In the study, 25 rats were fed the stroke-prone diet for 8 weeks and received either no medication, telmisartan alone, ramipril alone, or the two drugs together at either full- or half-doses.

"A main finding was that combination therapy did reduce blood pressure the best of any treatment, and it also was best at cutting damage to the rats' hearts and kidneys," Dr. Catanzaro says. "But what was really surprising to us was that any regimen involving telmisartan at doses that would normally be given to humans completely prevented stroke in this model. Most studies with other drugs have used much higher doses and have found only partial protection."

Specifically, 83 percent of rats given no medication showed signs of stroke, as did 56 percent of rats given ramipril alone. However, no strokes were noted in the telmisartan-only or the telmisartan/ramipril combo groups.

Telmisartan's ability to easily pass through the blood-brain barrier (something ramipril cannot do) is likely behind the neuroprotective effect noted in the study, the researchers say.

"Going forward, that's something that we would really like to test out in head-to-head trials pitting telmisartan against other ARBs, for example," Dr. Catanzaro said. "At the same time, we'd like to examine whether telmisartan is actually getting into the brain, or if more peripheral effects -- a lowering of blood pressure, for instance -- are behind the reduction in stroke."

In the meantime, Boehringer Ingelheim is nearing the end of a major clinical trial looking at the effectiveness of combining telmisartan with ramipril to lower patients' blood pressures and reduce their odds for heart attack and stroke. Dr. Catanzaro's team is not involved in that study.

Source: New York- Presbyterian Hospital