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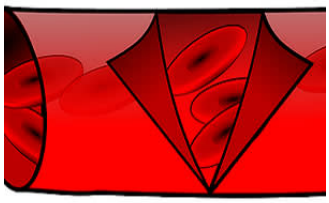
New protocol for rapid blood vessel scan



Claustrophobia is one reason why some patients are hesitant to undergo a magnetic resonance imaging (MRI) test, even if this procedure will help in the diagnosis of an ailment. To help solve this problem, researchers at UCLA have developed a new procedure that can scan blood vessels in five minutes or less. In contrast, magnetic resonance angiography (MRA), an MRI exam of blood vessels, takes 30 minutes to one hour to complete.

During an MRA, the patient lies on a table inside a tunnel-like tube and must remain still. A dye, called a contrast agent, is injected into the veins so the vessels can be seen more clearly. The patient is given a headset to block out noise from the scanner.

"Lengthy scans can be problematic for patients with even modest levels of claustrophobia who may refuse the test or ask for it to be stopped early," said Dr. Puja Shahrouki, research fellow, David Geffen School of Medicine at UCLA, Los Angeles, U.S. "They also limit the number of patients that can be scanned each day. In addition, the usual gadolinium-based contrast agents can be an issue for patients with kidney problems."

Even with the shorter scan time, the new procedure was able to deliver high quality images. The contrast agent used in the UCLA study was ferumoxytol, which researchers say stays within the vascular system for much longer than gadolinium-based dyes. The study included seven claustrophobic patients aged 11 to 63 years with kidney failure. There were four men and three women. All patients said they were reluctant to undergo MRA due to claustrophobia, but agreed to a trial of up to 10 minutes in the scanner bore.

Eight MRA scans using ferumoxytol were conducted. All scans were completed and there were no adverse events. Scans took an average of 6.27 minutes (range 4 to 10 minutes). All scans were high quality and allowed full visualisation of the arterial and venous anatomy from the neck to the thighs. Some of the scans were completed in less than five minutes once the procedure started.

With this new protocol, it is possible to scan several patients in an hour as opposed to just one or two, raising promising possibilities for workflow and efficiency, according to the researchers. "For appropriate types of studies, it could also shorten waiting lists and improve the cost-benefit ratio for hospitals," said Dr. Shahrouki. The study was presented at CMR 2018.1 held in Barcelona, Spain.

The new protocol should be technically easier than current practice because there is no time pressure for taking images. Ferumoxytol is increasingly recognised as an alternate contrast agent in patients with poor kidney function, but is not marketed outside the U.S. It is approved by the FDA only for the treatment of iron deficiency anaemia in adults with chronic kidney disease.

Hypersensitivity reactions have occurred in patients receiving ferumoxytol as a high dose for therapy in a short period of time, and the FDA has warned against this. The new MRA protocol administers the dye by slow infusion outside the MRI machine while monitoring the patient's vital signs, in compliance with FDA guidelines. A preliminary study showed this was safe and a larger registry is generating a safety profile of slow infusion under close monitoring. More safety data will be needed before any conclusions can be drawn about the true rate of hypersensitivity reactions and in the meantime close monitoring is the rule.

Source: European Society of Cardiology
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