

Non-invasive blood flow measurements reduce invasive tests in chest pain patients

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According to results of the PLATFORM (Prospective Longitudinal Trial of FFRCT: Outcome and Resource Impacts) trial, a test known as FFRCT can obviate the need for invasive tests in up to 61% of patients who have chest pain and suspected coronary artery disease.

FFRCT estimates fractional flow reserve (FFR) - a measure of blood flow and pressure in the coronary artery – using images from computed tomographic angiography (CTA).

The Hot Line results were presented today at ESC Congress 2015 (possible simultaneous publication in *European Heart Journal*).

"This approach significantly reduced the need for unnecessary invasive coronary angiography (ICA) which, although it is the gold standard for investigating [chest pain](#), comes with the risk and costs of an invasive procedure," said lead investigator Pamela Douglas, MD, the Ursula Geller Professor at the Duke Clinical Research Institute, Duke University School of Medicine, in Durham, NC, USA.

"The message is that for stable chest pain patients in whom elective ICA is recommended, consideration should be given to performing this new test first."

When used alone, CTA can identify an abnormal narrowing (stenosis) in the coronary arteries but it cannot quantify how much this actually obstructs blood flow. Therefore "many patients who have blockages that

are not interfering with blood flow may end up undergoing ICAs that show no evidence of obstructive [coronary artery disease](#) (CAD) and could possibly have been avoided, " explained Dr. Douglas.

Other commonly used non-[invasive tests](#) for CAD, such as myocardial perfusion stress imaging or stress echocardiography, may tell whether blood supply to the heart tissue is adequate but cannot determine whether a specific blockage is obstructing blood flow, she said.

The current standard for assessing the significance of coronary artery narrowing is conventional FFR, which is invasive, involving insertion of a wire into the coronary artery.

But by using computer simulations to calculate [blood flow](#), non-invasive FFRCT can give a comprehensive evaluation of a patient's chest pain without the need for an invasive procedure.

The PLATFORM study included 584 chest pain patients (average age 60.9 years) from 11 test centres in Europe.

Patients were evaluated using either FFRCT (n=297) or conventional testing (n=287) to see if FFRCT could reduce the rate of ICAs that show no obstructive CAD.

Patients were divided into those in whom "usual care" would dictate a non-invasive investigation such as stress testing or conventional CTA (n=204) and those who would have proceeded straight to an invasive ICA (n=380).

In both groups patients were then allocated to receive either usual care (invasive or non-invasive) or FFRCT - defined as CTA with the addition of FFR when appropriate.

Among patients already scheduled for an ICA, 73% of patients in the usual care group underwent ICA only to find no significant blockages, compared to 12% in the FFRCT group. Furthermore, 61% of the patients in the FFRCT group had the ICA cancelled based on the FFRCT results.

While FFRCT reduced the number of patients who underwent an ICA that found no significant disease, there was no difference between the two groups in the rate of revascularisation procedures, such as stenting and [coronary artery](#) bypass surgery.

"The study shows that CTA plus FFRCT more effectively triages [patients](#) for invasive procedures than usual care strategies," said Dr. Douglas. "Although FFRCT is a relatively new technique, PLATFORM demonstrates that it is feasible and safe with high utility in busy clinical settings."

Provided by European Society of Cardiology

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