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Brokering Innovation Through Evidence

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How useful are inflammatory marker tests in primary care?

Blood tests known as 'inflammatory markers' can detect inflammation in the body, caused by many diseases including infections, auto-immune conditions and cancers. The tests don't identify what's causing the inflammation: it might be as simple as a viral infection, or as serious as cancer.

Millions of inflammatory marker tests are ordered by GPs in England each year and rates of testing are rising. Many of these tests will be done appropriately, but GPs are increasingly using them as a non-specific test to rule out serious underlying disease.

Until now there has been no evidence about whether this is a good strategy.

Inflammatory marker tests can help doctors feel more confident that they are not missing anything. But they can sometimes sound a false alarm.

If results are abnormal, a doctor might need to repeat the test or do more tests to find out what's wrong. Sometimes doctors never find a cause for the inflammation and the results go back to normal on their own.

What was the aim of the project?

This project aimed to improve the use of inflammatory marker tests in primary care. It intended to address when GPs should use inflammatory marker tests, how they should interpret results and how this information should be shared with patients.

The research is supported by the National Institute for Health Research (NIHR) Applied Research Collaboration (ARC West) at University Hospitals Bristol NHS Foundation Trust.

What did we do?

Dr Jessica Watson, who led this study, is a GP. She had already interviewed doctors and nurses about inflammatory marker tests. They told her they aren't always sure when to use the tests or what to do with the results. Jessica also reviewed previous research on the topic, but most was in hospitals and didn't provide clear guidance for GPs.

In this study, Jessica analysed the primary care data of 200,000 people from the Clinical Practice Research Datalink, a service that collects anonymised patient data from GP practices across the UK. Of those people, 160,000 patients had had inflammatory marker tests in 2014, and 40,000 patients hadn't had the test.

What we found and what this means

Where patients tested positive for raised inflammatory markers, 15 per cent were caused by disease such as an infection, autoimmune condition or cancer.

In the remaining 85 per cent of patients with raised inflammatory markers, no relevant disease could be found. These results are known as 'false positives'. False positives lead to increased rates of follow on GP consultations, tests and referrals.

The researchers calculated that, for every 1,000 inflammatory marker tests performed, 278 would result in a raised inflammatory marker, and of those, 236 would be false positives. They also calculated that these false positives would lead to 710 GP appointments, 229 blood test appointments and 24 referrals in the following six months.

The study also found that half of the patients with a relevant disease had normal test results, or a 'false negative'.

The team concluded that inflammatory marker tests have poor sensitivity and should not be used as a test to rule out diseases.

What next?

Bristol, North Somerset and South Gloucestershire Clinical Commissioning Group (BNSSG CCG) is working with the University of Bristol to implement these findings, aiming to ensure that inflammatory marker tests are used for the right people, at the right time.

The next stage will involve interviewing patients who have recently had inflammatory marker tests, and the GPs who ordered the tests. The experiences reported will inform resources to improve how GPs communicate with patients about inflammatory marker tests.

Read the papers

Added value and cascade effects of inflammatory marker tests in UK primary care: a cohort study from the Clinical Practice Research Datalink
Jessica Watson, Chris Salisbury, Penny Whiting, Jonathan Banks, Yvette Pyne, Willie Hamilton

Published in the British Journal of General Practice
bit.ly/InflammatoryMarkerTests

Use of multiple inflammatory marker tests in primary care: using Clinical Practice Research Datalink to evaluate accuracy
Jessica Watson, Hayley E Jones, Jonathan Banks, Penny Whiting, Chris Salisbury, Willie Hamilton

Published in the British Journal of General Practice
bit.ly/InflammatoryMarkers

Find out more

arc-w.nihr.ac.uk/inflammatory-markers

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