Anti-coagulants work better with genetic testing, study finds

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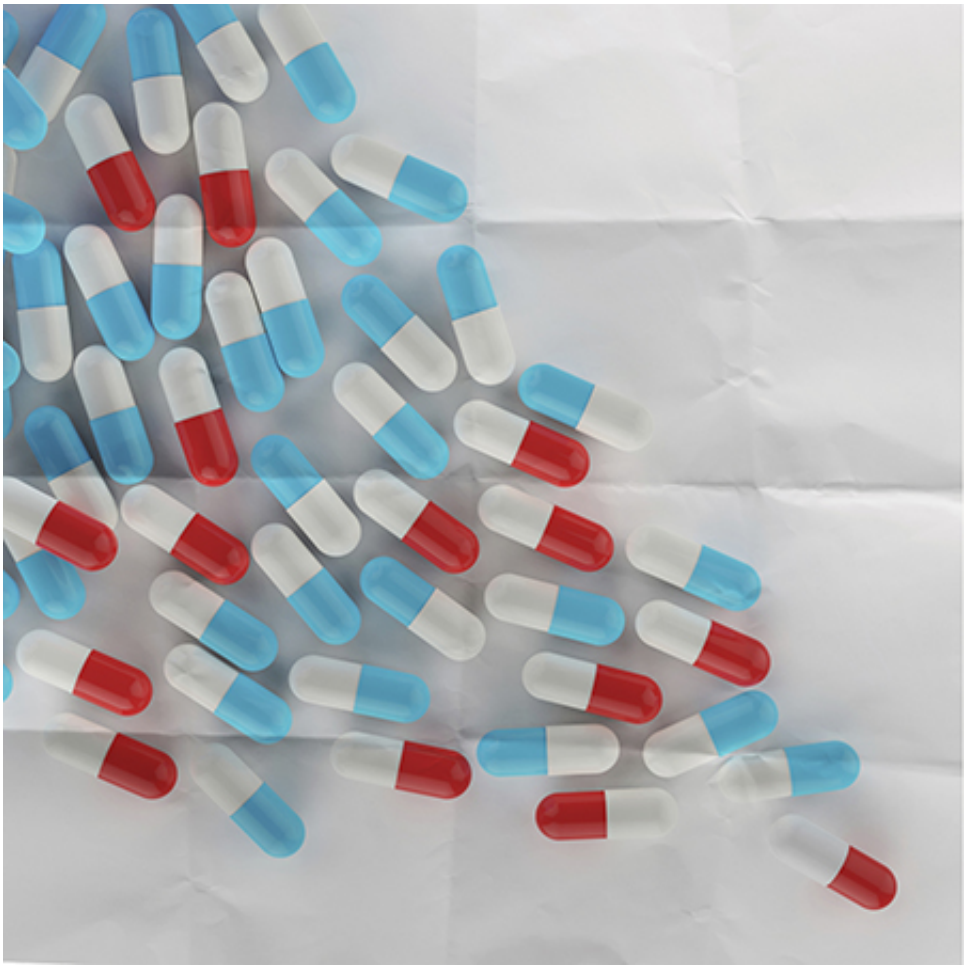

The study showed that patients who were on the genotype-based dose spent 67% of their time in the ideal range – 7% more than the group on the standard dose.

The effectiveness of one of the most widely used anti-coagulant drugs

can be improved if genotype testing is carried out before the dose is decided, according to the findings of a new study from the University of Liverpool, and its collaborators, the Universities of Newcastle and Uppsala.

In new research, which was presented yesterday in front of thousands of delegates at the world's largest cardiology conference in Dallas, USA, Professor Munir Pirmohamed, from the University's Institute of Translational Medicine, tested the effect of warfarin when it is prescribed in a standard dose and when it is prescribed based on genotype testing of patients.

Doses constantly monitored

Warfarin is the main anticoagulant taken orally in the UK, Sweden and many other parts of the world, including the US. It is used to treat deep vein thrombosis, and lung and heart problems caused by blood clots. Doses have to be constantly monitored, however, since variations in genetic makeup, age and size can cause either too small an effect from the medicine or even too much – which can cause bleeding in patients.

Genotyping of patients to help calculate the dose is not currently recommended but it is known that variation in the genes which are involved in the vitamin K cycle (crucial for blood clotting) and the metabolism of the drug can make a difference between patients.

To test this difference, Professor Pirmohamed and his team studied 455 patients in a trial undertaken in the UK and Sweden, with patients recruited in the UK by the Royal Liverpool University Hospital.

Half of the patients were prescribed warfarin based on their genotype test results, while the other half were prescribed the standard dose. Blood clotting is measured using the International Normalised Ratio (INR)

score and the researchers were looking for the amount of time patients spent within the INR range of two and three.

The study showed that patients who were on the genotype-based dose spent 67% of their time in the ideal range – 7% more than the group on the standard dose. Furthermore, the first group also had far fewer instances of an INR of four or higher, which can lead to an increased risk of bleeding. It also took less time for the medicine to become effective – 21 days in the genotyped group, compared to 29 in the standard dose group.

Major implications

This research was presented by Professor Pirmohamed at the American Heart Association Scientific Sessions in Dallas, USA yesterday (19 November), which is attended by more than 18,000 delegates from over 100 countries. It was also published in the *New England Journal of Medicine*.

Professor Pirmohamed, who is Director of the University of Liverpool's Wolfson Centre for Personalised Medicines, and Liverpool Health Partners' Clinical Academic Programme Lead for Drugs, said: "Warfarin is extremely useful but difficult to prescribe in the most efficient way.

"We have been able to show that personalising the dose to the patient, based on their genes, age and body weight, can help set the right dose and reduce both risk and the time it takes for the medicine to become effective, when compared with the standard doses used in the UK and Sweden.

"This could have major implications for the use of a drug that is taken by millions of people with serious conditions every year."