Computers as safe as medical experts for prescribing blood thinning drugs

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The largest ever study into the administration of blood thinning drugs, principally Warfarin, has concluded that dosages calculated by computer are at least as safe and reliable as those provided by expert medical professionals. Increasing evidence of the value of these anticoagulant drugs in a wide range of clinical disorders such as abnormal heart rhythm, or atrial fibrillation, has led to a rapid rise in their use around the world.

However, prescribing the right oral dose of anticoagulant to patients, even for experienced medical staff, can be problematic as individuals differ greatly in response to a given dose and a single patient's response can change over the period of an illness. Too high a dose for an individual and the blood becomes too thin and can lead to internal bleeding, too low and the blood clots too readily.

Previous studies supporting the use of computer-assisted dosage have depended solely on laboratory results and have not been sufficiently large to determine whether prolongation of normal blood clotting – measured as the 'international normalised ratio' or INR – resulted in clinical benefit and improved safety.

But now results from the five-year clinical trial have shown that computer-assisted dosage is as good, if not better, at prescribing the correct dosage to prolong the INR in patients as dosages given by expert medical professionals.

"The need for computer assistance arises from the massive demand for oral anticoagulants following their success at treating an increasing number of thrombotic and embolic conditions," said Professor Leon Poller, who co-ordinated the international team with its Central Facility at Manchester's Faculty of Life Sciences.

"This increased demand has been overwhelming and stretched medical facilities worldwide to their limits. Computer dosage was introduced as a way to meet this demand but its safety and effectiveness had not previously been established."

The study, published in the Journal of Thrombosis and Haemostasis, was carried out in 32 medical centres across the European Union and associated countries involved more than 13,000 patients. It analysed nearly 400,000 INR tests, divided evenly between manual and computer-assisted dosage.

The percentage of manual tests to give the correct INR was 64.7%, compared to 65.9% for computer-assisted dosage, confirming the effectiveness of the two programs tested by the team.

In terms of safety, the number of INR tests that resulted in clinical complications was 7.6% lower in all clinical groups with computer-assisted dosage, dispelling any safety concerns.

Indeed, while this overall reduction was not statistically significant, in the 3,209 patients with deep vein thrombosis or pulmonary embolism, the number of clinical events following treatment were significantly lower for computer dosage – 9.1 per 100 patient-years with medical staff dosage was reduced to 6.1 in the computer arm.

"The results are even more impressive when you consider that the comparisons were made against medical professionals based at centres that specialised in prescribing oral anticoagulants," said Professor Poller.

"At the very least, our study confirms the clinical safety and effectiveness of computer-assisted dosage using the two systems we tested and should help to bring relief to overstretched medical professionals while providing reassurance to patients."

Copies of the paper 'An international multi-centre randomized study of computer-assisted oral anti-

coagulant dosage vs. medical staff dosage' are available. See www.journalth.com/

Source: University of Manchester