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Simple cardiac blood test before surgery can predict adverse outcomes

A common cardiac blood test done before surgery can predict who will experience adverse outcomes after most types of surgery, says an international study led by Canadian researchers.

Globally, of the 200 million adults who undergo major surgery, 18% will experience serious cardiac and vascular complications including death within 30 days following their intervention, such as hip and knee replacements, bowel resections and abdominal aortic aneurysm repair.

‘Any type of surgery has the potential to cause damage to heart tissue, through blood clot formation, long periods of inflammation, or bleeding,’ said study lead, Dr PJ Devereaux, professor of medicine, cardiologist at Hamilton Health Sciences (HHS) and scientific lead for peri-operative research at McMaster University and HHS’ Population Health Research Institute (PHRI).

The VISION study looked at whether levels of a cardiac blood test, NT-proBNP, measured before surgery can predict cardiac and vascular complications. Higher levels of NT-proBNP, which can be caused by various anomalies in the cardiac muscle, such as stress, inflammation or overstretch, can help identify which patients are at greatest risk of cardiac complications after surgery.

The study included 10 402 patients aged 45 years or older having non-cardiac surgery with overnight stay from 16 hospitals in nine countries. ‘As a result of these findings, doctors can predict who is at greater risk of heart attacks and other negative vascular events after surgery,’ said Devereaux.

This phase of the VISION study builds upon six years of

research studies to understand pre- and post-operative factors that lead to cardiac complications. ‘This simple blood test can be done quickly and easily as part of a patient’s pre-operative evaluation, can help patients better understand their risk of post-operative complications and make informed decisions about their surgery,’ said first author of the publication, Dr Emmanuelle Duceppe, internist and researcher at the Centre Hospitalier de l’Université de Montreal (CHUM), PhD candidate in clinical epidemiology at McMaster University, and associate researcher at PHRI. ‘This blood test is 20 times cheaper than more time-consuming tests such as cardiac stress tests and diagnostic imaging.’

Results of this simple blood test may inform the type of surgery the patient will undergo, such as laparoscopic or open surgery, the type of anaesthesia used during surgery and who will require more intense monitoring post-operatively. Blood test results can also reduce the need for pre-surgical medical consultations for patients who show no risk for cardiac complications.

‘Heart injury after non-cardiac surgery is emerging as an important health issue requiring attention. Using CIHR funding, the research group led by PHRI and Devereaux has clarified the association between an elevation of a common biomarker and the risk of per-operative morbidity and mortality,’ said Dr Brian H Rowe, scientific director, Institute of Circulatory and Respiratory Health, Canadian Institutes for Health Research.

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