New tool calculates risk of bleeding in heart attack patients

April 14 2009

With eight basic medical facts in hand, doctors can now estimate the risk of bleeding for a patient having a heart attack. Using clinical variables, researchers at Washington University School of Medicine in St. Louis, Duke University and collaborating institutions have created a new method to estimate bleeding risk and help lessen the chances that heart attack patients will experience this common complication.

"Until now, there hasn't been a simple tool applicable to the general population that can predict the risk of bleeding before patients are treated for heart attack," says one of the study's authors, Richard G. Bach, M.D., a Washington University cardiologist and medical director of the Cardiac Intensive Care Unit at Barnes-Jewish Hospital. "Older methods for estimating risk either were derived from a low-bleeding-risk population or used variables that aren't available until after treatment is begun."

The bleeding-risk assessment tool is described in a study that appeared April 14, 2009, in the journal *Circulation*.

Doctors treat heart attacks with medications and procedures intended to prevent ischemic complications, or damage caused by lack of oxygen to the heart. But these treatments —anticlotting drugs and catheter-based interventions to the heart — also increase the likelihood of bleeding, which can be deadly.

"The risk of bleeding is substantial in people with heart attacks," says

study co-author Brian F. Gage, M.D., a Washington University internist and director of the outpatient Anticoagulation Service. "We found that this population could be risk-stratified, so that people at high risk of bleeding could receive less aggressive anticoagulant and antiplatelet therapy while those at low risk could receive full-dose therapy."

Led by Sumeet Subherwal, M.D., formerly a Barnes-Jewish Hospital medical resident at Washington University Medical Center and now a cardiology fellow at Duke University, and in collaboration with several investigators including Karen Alexander, M.D., a cardiologist at the Duke Clinical Research Institute, the researchers analyzed the medical histories of more than 89,000 patients hospitalized in the United States for non-ST-elevation heart attack. This type of heart attack is the most common and usually results from a partial rather than complete blockage of the heart's arteries.

The patient histories were part of the CRUSADE Quality Improvement Initiative, a national multicenter program that aims to improve outcomes for heart attack patients. The risk assessment tool is called the CRUSADE bleeding score.

"A lot of treatment decisions have to be made very promptly after the patient arrives," says Bach, also associate professor of medicine in the Cardiovascular Division at Washington University School of Medicine. "So we designed a bleeding-risk stratification tool that would require only those variables that can be obtained up front. It's a practical tool that can be used in any hospital setting."

The CRUSADE analysis identified eight factors that could predict the odds that a heart attack patient might suffer a bleeding event. The factors are gender, heart rate, blood pressure, hematocrit (the concentration of red cells in the blood), creatinine clearance (a measure of kidney function), diabetes, peripheral vascular disease or stroke, and

congestive heart failure.

The bleeding score calculation assigns points to each factor so that the total score coincides with risk of bleeding evidenced in the CRUSADE cases. The range of possible scores is divided into five categories from very low to very high risk of bleeding.

The bleeding risk score is intended to help guide critical early treatment decisions for clinicians caring for heart attack patients, but the impact of its use on outcomes will need to be tested in clinical trials, says Bach. Potentially, the score will be used in conjunction with other practice guidelines to optimize heart attack treatment and minimize risk.

More information: Subherwal S, Bach RG, Chen AY, Gage BF, Rao SV, Newby LK, Want TY, Gibler WB, Ohman EM, Roe MT, Pollack CV, Peterson ED, Alexander KP. Baseline risk of major bleeding in non-ST-segment elevation myocardial infarction. *Circulation*. April 14, 2009.

Source: Washington University School of Medicine (news : web)