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GENE TEST DETERMINES RISK OF HEART SURGERY COMPLICATIONS

*Genetic Differences Explain Why Some are Predisposed to Shock and Kidney Troubles;
Gene Test Guides Treatment Post Operation*

Washington, DC (April 24, 2009) — Genetic differences can explain why some patients undergoing heart surgery later experience shock and kidney complications, according to a study appearing in an upcoming issue of the *Journal of the American Society Nephrology* (JASN). The results indicate that performing a genetic test on patients before they have surgery can help guide treatment after they leave the operating room.

While cardiac surgery puts an individual at risk for developing shock and kidney failure, there are no effective medications to prevent these complications. When shock occurs, patients are often given norepinephrine to stimulate their blood vessels and normalize their blood pressure. Unfortunately, people respond differently to norepinephrine—some metabolize it efficiently, while others do not. The likely reason for these differences lies within biological pathways that metabolize norepinephrine and involve the enzyme catechol-O-methyltransferase (COMT).

Duska Dragun, MD and Anja Haase-Fielitz, PhD (Charité Universitätsmedizin Berlin, Germany), studied with colleagues (Max Delbrück Center for Molecular Medicine, Germany; Austin Hospital, Australia) the gene that encodes COMT in 260 patients who underwent heart bypass surgery. They found that a particular genetic variant in some individuals can lead to lower activity of the COMT enzyme, which makes them less responsive to norepinephrine's effects. People who had this variant (called LL) were more likely to develop shock and kidney failure, requiring a hospital stay for a longer period of time.

The link between the COMT LL variant and these complications may be pronounced in women because protective estrogen metabolites can be inactivated by norepinephrine. Additional studies are needed to test this hypothesis.

MORE

If this study's results are confirmed in larger clinical trials, physicians could use a COMT gene test to help them determine a patient's risk of developing complications following cardiac surgery and could therefore help them prepare for their patient's post-surgery care.

The authors report no financial disclosures.

The article, entitled "Decreased Catecholamine Degradation Associates with Shock and Kidney Injury after Cardiac Surgery," will appear online at <http://jasn.asnjournals.org/> on April 30, 2009, doi 10.1681/ASN.2008080915.

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