Gene polymorphisms to identify altered effectiveness of beta blocker therapy in cardiac surgery candidates

Unmet Need

Postoperative atrial fibrillation (AF) is the most common complication following the coronary artery bypass graft surgery (CABG), occurring in 20% to 40% of patients. Studies indicate that postoperative AF is associated with an increased incidence of congestive heart failure, myocardial infraction, renal insufficiency and neurological events, resulting in longer hospital stay and increased total cost of surgery. The additional healthcare costs related to postoperative AF exceed $10,000 per patient, translating to more than $1 billion each year in the United States alone. Use of beta-blockers is a main way of prevention and treatment of postoperative AF. However, approximately 20% of patients undergoing CABG surgery develop postoperative AF despite the beta-blockers use. This calls for a need for identification the causes of increased risk for such altered beta-blocker effectiveness and methods for personalized treatment of patients with increased risk.

Technology

Duke researchers discovered four particular alleles of DNA polymorphisms that are associated with an increased risk of altered effectiveness of beta blocker therapy. They developed a method and a DNA test kit for screening patients for these polymorphisms prior to CABG surgery. Identification of the increased risk will allow to prevent postoperative AF and to offer these patients personalized strategies or alternative treatment options. The researchers conducted several clinical studies that demonstrate the association of polymorphisms in G-protein coupled kinase 5 (GRK5) gene with increased risk for postoperative AF in

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Publication(s)

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External Link(s)

• From the lab of Dr. Miklos Kertai

patients who undergo CABG surgery and were treated with postoperative beta blockers.

Advantages

- Allows to identify patients with increased risk for AF
- Will allow to reduce hospital stays and cost of care for some GABK patients by preventing complications
- Has been demonstrated in clinical studies