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UNIVERSITY OF MICHIGAN

Use of Soluble Urokinase Plasminogen Activator Receptor Levels in the Management of Patients with Cardiovascular Disease

TECHNOLOGY NUMBER: 2019-155

OVERVIEW

Novel use of soluble urokinase plasminogen activator receptor (suPAR) to predict outcomes

- A useful biomarker for those suffering coronary artery disease, heart failure, and kidney disease
- Can be used to determine the utility of specific treatments for these patient groups

BACKGROUND

The clinical management of patients with cardiovascular disease (CVD) is made more complex because the significant prognostic heterogeneity among patients with seemingly similar disease processes creates difficulties predicting benefits versus risks of specific interventions. Serum biomarker research in CVD patients focuses on ways to increase success in the screening, accurate diagnosis, and prognostic predictability of this group. Any useful new prognostic biomarker must show high specificity, low variability between patients, provision of information beyond existing markers, and a means by which to evaluate response to therapy. The transition of a biomarker from prognostic to predictive connotes its ability to tailor therapy to a specific patient,Äôs needs. Soluble urokinase plasminogen activator receptor (suPAR) is a protein measured in blood that is thought to reflect inflammation and activation in the immune system. As a signaling molecule, suPAR is thought to potentially cause illnesses where inflammation plays a role, so a need exists to further study this molecule and its predictiveness of disease processes.

INNOVATION

Researchers at the University of Michigan have discovered that soluble urokinase plasminogen activator receptor (suPAR) levels in blood are strongly predictive of clinical outcomes in various patient populations including those suffering from myocardial infarction, heart failure, renal dysfunction, and death. Blood levels of suPAR vary greatly in patients with heart disease, and their values can aid clinicians in treatment and management decisions that might otherwise prove challenging. For example, patients with severe coronary artery disease and high suPAR levels may benefit from coronary bypass graft surgery rather than coronary stenting. Additionally, the measurement of suPAR levels in patients with stable coronary artery disease could identify those who would benefit from treatment with statins or immunomodularity

Technology ID
2019-155

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Diagnostics
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Author(s)
Salim Hayek

Further information
Megan Griffin
mrost@umich.edu

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therapy. A similar approach could identify heart failure patients with concomitant kidney dysfunction to determine which should receive intervention with mechanical circulatory assist devices or be placed on a heart transplantation list. In general, the measurement of suPAR levels could determine which hospitalized patients are at a higher risk for worsened cardiovascular disease, thereby allowing for appropriate resource allocations to those who would benefit the most after discharge.