Indicators for Treatment of Bicuspid Aortic Valve and Aortopathies

Elevated plasma sRAGE is associated with bicuspid aortic valve and related aortopathies

Inventors
Giovanni Ferrari, PhD
Emanuela Branchetti, PhD

Problem:
Bicuspid aortic valve (BAV) is the most common congenital heart defect in the US, with an approximate incidence of 1 in 50 births. BAV frequently leads to valve dysfunction and is associated with serious adverse aortic events such as aortic aneurysm, dissection and rupture. The primary surgical intervention for BAV is aortic valve replacement. The clinical parameters (aortic diameter, expansion rate, ratio of aortic area to body weight) currently used to determine whether surgical intervention is needed for patients with BAV are imperfect as many BAV patients do not meet these criteria, but may go on to develop a serious aortic event before surgical intervention is indicated. There is a need for the development of alternative diagnostic methods and indicators for surgical intervention for BAV patients in order to reduce the risk of patients developing life-threatening cardiac events.

Solution:
Research conducted by Drs. Giovanni Ferrari and Emanuela Branchetti demonstrates that plasma levels of the soluble receptor for advanced glycation end products (sRAGE) may be a novel biomarker for BAV and related aortopathies. Elevated sRAGE was found to be highly associated with both BAV and aortopathies. Importantly, sRAGE elevation was independent of aortic diameter and the ratio of aortic area to body weight, which are two clinical parameters currently used to assess whether a patient should undergo surgery. This work suggests that circulating plasma sRAGE levels could be used in the diagnosis of BAV and aortopathies and to identify patients needing surgical intervention.

Advantages
- Novel diagnostic parameter for BAV and aortopathies
- Simple blood test measurement

Applications
- Diagnosis of BAV and associated aortopathies
- Indicator for surgical intervention for BAV and associated aortopathies