Soluble ST2

Indications for Ordering

- Prognostication for patients with acute or chronic heart failure (CHF), in conjunction with natriuretic peptides
- Risk stratification and assessment for patients with known cardiovascular disease

Test Description

Quantitative enzyme-linked immunosorbent assay

Tests to Consider

Primary test

ST2, Soluble 2002270

- Aid in prognostication for patients with acute or chronic heart failure

Related tests

Preferred tests for diagnosis, prognosis, and management of patients with acute or chronic heart failure

- B-Type Natriuretic Peptide 0030191
- proBrain Natriuretic Peptide, NT 0050083

Use for prognostication in heart failure

- Galectin-3, Serum 2007138
  - Test complements prognostic value of N-terminal pro-brain natriuretic peptide (NT-proBNP)

Disease Overview

Incidence – 5.7 million patients with CHF; risk increases with age (CDC)

Physiology

- ST2 is a member of the interleukin-1 (IL-1) receptor family
  - Produced by cardiac fibroblasts and cardiomyocytes under conditions of mechanical stress
  - Two isoforms
    - Soluble ST2 (sST2) – a decoy receptor
    - ST2L – a receptor
- Ligand for ST2 isoforms is cytokine IL-33
  - IL-33 binds to sST2 in response to cardiac injury or disease
    - This binding makes IL-33 binding to ST2L impossible
      - Reduces cardioprotective effects afforded by ST2L binding with IL-33, such as reduced fibrosis and hypertrophy

Prognosis issues

- sST2 has been shown to aid in risk stratification of patients with CHF or acute coronary syndrome (ACS)
- sST2 assesses a different biochemical pathway than B-type natriuretic peptide and NT-proBNP
  - sST2 is an independent marker from natriuretic peptides and therefore provides additive risk stratification (Yancy, 2013)
    - Patients with elevated concentrations of both biomarkers are at greater risk of mortality than those with elevation of only one biomarker
  - sST2 is influenced by renal dysfunction
- sST2 is not useful in initial diagnosis of CHF or ACS

Test Interpretation

Results

- sST2 >35ng/mL is associated with increased 30-day and one-year risk of mortality in patients with CHF or ACS
  - Increased risk is associated with rising concentrations
- A decrease in sST2 concentrations is associated with decreased risk of mortality at one year

Limitations

- Possibility for interference with anti-reagent antibodies in patient specimen
- Biological variability or reference change value for healthy adults is 30%

Reference

Yancy CW, Jessup M, et al. 2013 ACCF/AHA Guideline for the Management of Heart Failure: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2013;62(16)