Plasminogen Activator Inhibitor-1 (SERPINE1) Genotyping

The plasminogen activator inhibitor 1 (PAI-1) protein, which is encoded by the SERPINE1 gene, is involved in hemostasis, or the normal blood clotting pathway. The 4G/5G polymorphism in the promoter region of this gene is a major determinant of PAI-1 expression. Individuals who are heterozygous or homozygous for the 4G allele may have an increased risk for venous thromboembolism (VTE), especially when there are other risk factors for thrombophilia. \(^1,2,3\) This genotype may also confer an increased risk for myocardial infarction (MI).\(^4\)

Genetics

Gene/Variants

The 4G/5G polymorphism is located at c.-817dupG (from start of translation) in the promoter region of the SERPINE1 gene.

Inheritance

Autosomal dominant

Frequency of the 4G allele varies by ethnicity:

- White: 0.52
- Hispanic: 0.38
- African American: 0.13-0.28

Test Interpretation

Sensitivity/Specificity

Analytic sensitivity/specificity: 99%

Clinical sensitivity: unknown

Results

<table>
<thead>
<tr>
<th>Genotype</th>
<th>Allele(s) detected</th>
<th>Clinical significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>5G/5G genotype</td>
<td>2 copies of 5G allele</td>
<td>Not at increased risk of VTE and MI Does not exclude other genetic or nongenetic causes of thrombosis</td>
</tr>
<tr>
<td>4G/5G genotype</td>
<td>1 copy of 4G allele</td>
<td>Associated with increased risk of VTE and MI, particularly in individuals with other thrombotic risk factors</td>
</tr>
<tr>
<td>4G/4G genotype</td>
<td>2 copies of 4G allele detected</td>
<td></td>
</tr>
</tbody>
</table>

Featured ARUP Testing

Plasminogen Activator Inhibitor-1, PAI-1 (SERPINE1) Genotyping 2004980

Method: Polymerase Chain Reaction/Fluorescence Monitoring

- Use to screen for genetic susceptibility for VTE or MI in individuals with a personal or family history of thrombotic events
- Aids in risk/benefit assessment for preventive or therapeutic interventions for VTE or MI
Limitations

- Variants other than the 4G/5G polymorphism in the SERPINE1 gene are not evaluated.
- Test does not evaluate risk for complete PAI-1 deficiency.
- Diagnostic errors can occur due to rare sequence variations.

References


Related Information

Venous Thromboembolism
Fibrinolytic Disorders
Hereditary Thrombophilia - Hypercoagulability