USEFUL FOR

Evaluation for risk of major adverse events due to cardiovascular disease within the next 1 to 5 years

CLINICAL INFORMATION

Plasma ceramides are predictors of adverse cardiovascular events resulting from unstable atherosclerotic plaque. Ceramides are complex lipids that play a central role in cell membrane integrity, cellular stress response, inflammatory signaling, and apoptosis. Synthesis of ceramides from saturated fats and sphingosine occurs in all tissues. Metabolic dysfunction and dyslipidemia results in accumulation of ceramides in tissues not suited for lipid storage. Elevated concentrations of circulating ceramides are associated with atherosclerotic plaque formation, ischemic heart disease, myocardial infarction, hypertension, stroke, type 2 diabetes mellitus, insulin resistance and obesity.

Three specific ceramides have been identified as highly linked to cardiovascular disease and insulin resistance: Cer16:0, Cer18:0, and Cer24:1. Individuals with elevated plasma ceramides are at higher risk of major adverse cardiovascular events even after adjusting for age, gender, smoking status, and serum biomarkers such as low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol, c-reactive protein (CRP) and lipoprotein-associated phospholipase A2 (Lp-PLA2). Direct interventional studies have not yet been reported; however, ceramide concentrations are reduced by current cardiovascular therapies including statins, ezetimibe, and Proprotein convertase subtilisin/kexin type 9 (PCSK9) activity.

INTERPRETATION

Elevated plasma ceramides are associated with increased risk of myocardial infarction, acute coronary syndromes and mortality within 1 to 5 years.

<table>
<thead>
<tr>
<th>CERAMIDE SCORE</th>
<th>RELATIVE RISK</th>
<th>RISK CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–2</td>
<td>1.0</td>
<td>Lower</td>
</tr>
<tr>
<td>3–6</td>
<td>1.8</td>
<td>Moderate</td>
</tr>
<tr>
<td>7–9</td>
<td>2.3</td>
<td>Increased</td>
</tr>
<tr>
<td>10–12</td>
<td>5.1</td>
<td>Higher</td>
</tr>
</tbody>
</table>

Score is based on trial data including >4,000 subjects.

REFERENCE VALUES

- Ceramide (16:0): 0.19–0.36 mcmol/L
- Ceramide (18:0): 0.05–0.14 mcmol/L
- Ceramide (24:1): 0.65–1.65 mcmol/L
- Ceramide (16:0) / (24:0): <0.11
- Ceramide (18:0) / (24:0): <0.05
- Ceramide (24:1) / (24:0): <0.45

Ceramide Risk Score:

- 0–2 Lower risk
- 3–6 Moderate risk
- 7–9 Increased risk
- 10–12 Higher risk

ANALYTIC TIME

2 days
CLINICAL REFERENCE


