Secretory IgA: The First-Line of Immune Defense

Evaluate this critical antibody with a convenient saliva test.

Healthy Levels of SlgA Help Prevent:
- Infections
- Food Sensitivity
- Dysbiosis
- Allergic Reactions
- Antigenic Overload
- GI, Immune, and Neurological Disorders
- General and Chronic Illness

Mucosal Defense

The mucosal barrier—the first-line of immune defense—refers to all of the mucous membranes that comprise the primary interface between the external environment and the internal environment of the body.

Secretory Immunoglobulin A (SlgA) is present in all mucosal linings of the body including the eyes, mouth, sinuses, throat, gastrointestinal system, respiratory system, vaginal tract and urogenital tract. When slgA is depressed, the body’s susceptibility to a wide range of pathogens increases. Unfortunately, the very problems associated with increased susceptibility (as a result of reduced slgA levels) are themselves often responsible for the initial, lowered, first-line immune defense.

SlgA the Protector

The most recognized function of slgA includes its role in “immune exclusion” in which it prevents viruses, bacteria and other antigens adhering to and penetrating epithelial mucosa. SlgA may also inhibit inflammatory processes that damage the mucosa and preliminary evidence suggests that it may play a role in inducing an antigen specific immune response by a non-inflammatory mechanism. A slgA deficiency may lower resistance to infection.

In addition, slgA functions in mucosal immunity and intestinal homeostasis through mechanisms that have only recently been revealed. In just the past several years, slgA has been identified as having the capacity to directly quench bacterial virulence factors, influence composition of the intestinal microbiota by Fab-dependent and Fab-independent mechanisms, promote retro-transport of antigens across the intestinal epithelium to dendritic cell subsets in gut-associated lymphoid tissue, and, finally, to downregulate pro-inflammatory responses normally associated with the uptake of highly pathogenic bacteria and potentially allergenic antigens.

Causes of Depressed and Elevated SlgA

Chronic stress adversely affects the mucosal immune system by way of its negative influence on cortisol levels, inflammation control, and antibody production. Under chronic stress, slgA production can be suppressed because of elevated cortisol. A reduction in slgA levels heightens the risk for an invasion of opportunistic organisms—namely viruses, parasites, bacteria, fungus, and yeast. Infections drive inflammation and erode the
barrier, compromising the secretion and transport of sIgA. Cortisol and DHEA(S) (steroidal hormone, immune modulators) systemically modulate the production of the immunocytes that produce sIgA. When cortisol and DHEA values are out of balance, immunocyte production can be suppressed resulting in lowered first-line immunity.

Sympathetic flow governs the ability of the immunocytes to release sIgA. Therefore, sympathetic overload (prolonged fight/flight) can result in lowered sIgA production and further compromise first-line mucosal immunity.

**S IgA and HPA Axis Dynamic**

Secretory immunoglobulin A (sIgA) has often been used as an indicator of general immune status, especially indicative of the function of the mucosal immune system. Measuring salivary levels of sIgA is a clinical biomarker that generally mirrors the sIgA levels in other mucosal tissues (e.g., gut) and has become a convenient tool to monitor changes in mucosal immune status.

In general, salivary sIgA levels are influenced by a number of factors including overall immune function, on-going immune challenges, circadian fluctuations, and glucocorticoids/stress. Acute stress generally results in a transient increase in sIgA levels, while chronic stress generally reduces measures of sIgA. In some ways, this mirrors the expression of cortisol to stress. Similarly, the diurnal pattern of sIgA appears to follow cortisol (high in the morning and progressively lower throughout the day) with one important difference: the response to awakening. The increased cortisol spike (CAR) upon awakening is not mirrored for sIgA; in fact, during the first hour of waking the sIgA levels see their largest decline (likely sIgA peaks while sleeping). So, while the overall diurnal curve appears to follow a similar pattern as cortisol, there are additional factors that influence this pattern.

**The S IgA Lab Test**

The lab analyzes a pooled saliva sample provided by patients collecting over the course of a day.

Reference ranges for sIgA:

<table>
<thead>
<tr>
<th>Level</th>
<th>Range</th>
</tr>
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<tbody>
<tr>
<td>LOW</td>
<td>25.0-75.0 μg/ml</td>
</tr>
<tr>
<td>EQUIVOCAL</td>
<td>75.0-145.0 μg/ml</td>
</tr>
<tr>
<td>HIGH</td>
<td>145.0-330.0 μg/ml</td>
</tr>
</tbody>
</table>

A deficiency of sIgA may be an indication of chronic stress, adrenal insufficiencies, bacterial colonization on molar surfaces, recurrent tonsillitis, adenoid hyperplasia, cutaneous candidiasis, intestinal barrier dysfunction, nutritional deficiencies, recurrent herpes infection, celiac, Crohn’s or ulcerative colitis. Patients presenting with low levels of sIgA are at greater risk of gastrointestinal infections, dysbiosis and autoimmune disorders. Such a patient may have increased IgG responses to multiple foods, or may be asymptomatic.

**Depressed sIgA may indicate one or more of the following:**

1. Autonomic nervous system imbalance
2. Stress causing elevated cortisol production
3. Damage to the lining of the intestinal tract
4. Bacteria, virus, parasite and yeast infections
5. Lactose intolerance
6. Gliadin intolerance
7. Food allergies
8. Antigen intolerance
9. Inflammatory bowel disease
10. Use of anti-inflammatory drugs
11. Need for improved lifestyle management involving diet, sleep, exercise, and emotional handling of stress

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Mantis, N., Rol, N., & Corthésy, B. (2011). Secretory IgA’s complex roles in immunity and mucosal homeostasis in the gut. Mucosal Immunol Mucosal Immunology, 603-611

